LIBRARY OF CONGRESS, FEB 20 1893 SMITHSONIAN DEPOSIT. 25936

THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 32 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, VENTILATION, WATER SUPPLY AND DISTRIBUTION, & GENERAL SCIENCE.

VOLUME LVIII.—No. 8. Whole No. 924. | NEW YORK, MONDAY, FEBRUARY 20, 1893. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager.
JOS. R. THOMAS, C.E., Editor. T. J. CUNNINGHAM, Asst. Editor.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

OFFICIAL NOTICE—
Ohio Gas Light Association 253
EDITORIALS—
Special Editorial Correspondence Relating to the Boston Meeting 253
The Present Status of Natural Gas in Ohio, by Prof. Edward Orton—Continued from page 225 254
Spontaneous Combustion of Coal 255
*The Latest Askins Gas Process Patent 255
Twenty-third Annual Meeting of the New England Association of Gas Engineers—Official Report—Revised by the Secretary 257
First Day, Morning Session—Roll Call—Telegram of Sympathy—Election of New Members—President's Address—Committee on President's Address.
Howlden's Plan for Controlling Gas Supply in Trains 258
Asphalt of Trinidad 259
*Examples of the Berlin Iron Bridge Company's Construction 260
Gas Power for Electric Lighting 262
Free Wiring 262
ITEMS OF INTEREST FROM VARIOUS LOCALITIES 263
Mr. Egner's Reference to "Bois'" Criticism—Annual Meeting, New Albany, Ind.—The Western Construction Company Secures the Richmond Contract—Capt. Wilcox Retires from the Macon Company—Mr. Leetch Assumes the Manager's Position, Washington, D. C.—Changes at La Porte, Ind.—Something from Williamsport, Pa.—Annual Meeting, Washington, D. C.—The Knox Gas and Electric Company—Legislation on New York Gas Matters—Something from Belleville, Ills.—Hints from Middletown, N.Y.—A Gas Thief at Baltimore—An Answer to "H."—The New Hampshire State Gas Bill—Proposed Gas Legislation in Pennsylvania—And Many Other Items.
New Method of Preparing Filaments for Glow Lamps 265
The Market for Gas Securities 266

[OFFICIAL NOTICE.]

Ohio Gas Light Association.

OFFICE OF SECRETARY, COLUMBUS, O., Feb. 13, 1893.

To the Members of the Ohio Gas Light Association:

The Ninth Annual Meeting of the Ohio Gas Light Association will be held at Columbus, O., on March 15 and 16, 1893.

The arrangements for the meeting will be the same as they were last year. The sessions will be held in the Employees' Hall of the Columbus Gas Company, and the hotel headquarters will be the Chittenden, one square distant. Members are advised to secure rooms in advance.

The following papers have been promised:

1. "The Present State of the Art of Purification in Closed Vessels," by S. F. Hayward, New York City.
2. "A Test of the Backus Heater," by Jerome Penn, Washington Court House, O.
3. "Should Small Gas Companies Put in Electric Light Plants?" by H. L. Hurlburt, Oberlin, O.
4. "Is the Wilkinson Process Economical for a Small Works?" by J. F. Seamon, Uniontown, Pa.
5. "Discrimination by Gas Companies in the Treatment of their Consumers," by G. A. Allen, Zanesville, O.
6. "Governor Burners," by Irvin Butterworth, Columbus, O.
7. "Oils for Gas Enriching," by A. S. Miller, Chicago, Ills.
8. "The Present and Future Competition of Gas and Electricity," by Joseph Gwynn, Steubenville, O.

In addition to the foregoing, we have a conditional promise of a paper on the subject, "Are We Any Nearer the Solution of the Fuel Gas Problem?"

There will be the usual "Question Box," for which members are requested to send to the Secretary, well in advance of the meeting, any questions which they desire to have answered. The Executive Committee has also recommended that a portion of one session be set apart for "miscellaneous discussions."

The meeting promises to be interesting, and it is hoped there will be the usual generous attendance. Visitors will be welcome.

Respectfully, IRVIN BUTTERWORTH, Secretary.

SPECIAL EDITORIAL CORRESPONDENCE RELATING TO THE BOSTON MEETING.

BOSTON, MASS., Wednesday, Feb. 15, 1893.

Dear JOURNAL. The first day's session of the 22d annual meeting of the New England Association of Gas Engineers has just been adjourned, and I seize the opportunity afforded by the lull that precedes the banquet to send along a line or two respecting the doings of the first day. The weather conditions, in so far as the atmospheric portion of the same was concerned, were about all that one could wish for, but the trouble is that one cannot walk on air, and the slush in the streets of the city is so plenty and befouling that one would be all the better off could he travel as do the birds. Still, the arrangement of having the headquarters, meeting room and sleeping apartments all under one roof puts an end to much of the trouble that the muddy streets would otherwise cause. Mother New England had quite a goodly attendance of her children when the proceedings were commenced, which were promptly opened by President Wood and Secretary Prichard, at 10:20 A. M. A glance around the room revealed the presence of quite a number of visitors, amongst whom I noted Dr. Wilkinson, and Messrs. Isbell, Hayward, Weber and Kreischer, of New York, Gas Commissioner Barker, C. H. Corbett, of Brooklyn, Wm. McDonald, of Albany, A. C. Wood, of Syracuse—on hand to see his clever son marshall the forces—Messrs. Flemming and Daily, of Jersey City, and F. H. Shelton, of Philadelphia. Honorary Member Col. Fred. Benson, of Brooklyn, was also on hand, bright, cheery and rugged as of old. Besides these many others were present. The representation of the members was very pleasing, although one mournfully noted that some chairs were tenantless, owing to the smiting hand of death, of the occupants that the Association had especially welcomed. It was thought the attendance on the first day might have been affected from the fact that it was Ash Wednesday, but that objection will not again have standing, since the Association decided to amend the law governing the date of meeting by clothing the Directors with power to change the days when these fall untowardly. I have no doubt, however, that the exceeding severity of the past winter season—which in the East was exceptionally bitter and provocative of bad results on the distribution end of the gas business—

was as much at fault as anything else; for all those who were present had his "tale of woe" to repeat over the hustling complaint times of last January, of broken mains, of difficulty attending the securing of supplies, and so on. However, the winter had its compensations, too, for usually following the recital of the dark side, came the cheerful admission that it had been a great season for gas sales.

President Wood carried the meeting along smoothly and well, as was to be expected, although his annual address* was somewhat disappointing, in that it made no reference to the queer moves that have been made and that are now in process of making respecting legislative interference with the gas supply of more than one Eastern State. However, there was good reason for this failure to touch upon the burning questions of the day and time, owing to the delicate nature of the relations that the President sustained towards some of the parties who precipitated the conflict in Massachusetts. It would have been a good opportunity for comment, were the conditions otherwise; and when all is said and done, Mr. Wood deserves great credit for the courage which enabled him to slight these matters altogether. His suggestion that the Association ought to begin by indexing, and continue by publishing in book form, its entire proceedings ought to be taken seriously and complied with, if the expense be not too great. However, if his proposed three years for the completion of the designated tasks be considered too burdensome, the matter could well be terminated in five years, and without an undue expenditure. His presentation of the benefits of attendance at meetings of this nature is beyond question sound, and I am also constrained to say "Amen" to the hint "absorption without reciprocity * * * demands tyrannical treatment." The papers were interesting, and were received with that attention which culminated in a rousing series of discussions; notably so in the case of the paper submitted by Mr. Allyn, of Cambridge. As before remarked, everything went along smoothly, and without friction; but, then, that is always to be expected at a New England reunion. The membership roll was increased by 10 names, and the officers chosen were the following:

President—C. H. Nettleton.
First Vice-President—C. D. Lamson.
Second Vice-President—S. J. Fowler.
Secretary and Treasurer—C. F. Prichard.
Directors—E. C. Learned, A. K. Quinn, F.W. Norton, J. A. Coffin and W. A. Learned.

The banquet call is now in order, and I will send you another budget to-morrow.—*.*

BOSTON, MASS., Feb. 16, 1893.

There is little to say other than that the dinner was brought off very nicely, and good fellowship as usual was the keynote to its complete enjoyment. Seventy shared in the good things of the feast, and speech and reminiscence were pleasant auxiliaries. The regular proceedings of the last day were not out of the usual order, and the "card" was fin shed in good time.

The paper list was augmented by two unexpected numbers, the first of which was by Mr. C. D. Sherman, on the "Removal of Carbon f om Retorts without the Use of the Steam Jet;" while the second, by by Mr. C. F. Spaulding, treated of "The Value of an All-round Man." Both were well-written, and provoked quite a discussion. The Question Box developed a fair number of inquiries, but one or two of these I think did not receive sufficiently extended consideration.

In fact, the meeting, as all concede, from beginning to end was interesting, entertaining and instructive, and its records will form another ample volume in testimony of the good work that has ever been performed by the gas men of New England. In closing, I may say the sentiment here is that the Brooklyn people who are in opposition to Mr. Addicks have secured control of the Brookline Company, and that piping times are ahead in Boston gas matters.—*.*

MR. MILLER ON MR. EGNER'S LETTER IN OUR ISSUE FOR LAST WEEK.—The following, from Mr. Alten S. Miller, Manager National Gas Light and Fuel Company, Chicago, Ills., under date of February 14, explains itself:

To the Editor AMERICAN GAS LIGHT JOURNAL: I note Mr. Egner's reply to my criticism in your issue of February 13th. I call it a reply because it is so headed; but I cannot see that Mr. Egner does reply in any way to the criticism I made. The point I made is that there is more heat in the finished gas than there is in the materials that enter into its composition. If Mr. Egner will kindly explain this, I will be under many obligations to him, as will no doubt be many others who are interested in the gas business. Very truly, ALTEN S. MILLER.

*See page 257.

[Continued from page 225.]

The Present Status of Natural Gas in Ohio.

[The second of a series of articles prepared by PROF. EDWARD ORTON for the *American Manufacturer*.]

On the whole, the Berea grit in Ohio does not at present hold out brilliant promise of furnishing fuel on any large and generous scale to any considerable part of our population. Still less does it promise to furnish supplies for manufactures of any sort. But as I have frequently pointed out, there is no ground for surprise when new fields of oil or gas are discovered within the limits of the formation. Its petroliferous contents are universally distributed and the slightest warping of the rocks in the accidents of their long history may produce conditions essential for the separation of its contents and the accumulation of oil and gas in the arches or terraces into which the rocks are bent. The weakness of these structural features, wherever they are found, fully accounts for the weakness of the gas fields and oil fields, as well as for their brief duration. The same fact also accounts for the difficulty that driller and geologist alike experience in finding the localities where the oil and gas lie concealed. There is but very little to mark the presence of the favored spots.

The Clinton Limestone as a Source of Gas.—Ohio led the way in introducing the world to two new and entirely unexpected sources of gas and oil, viz., the Clinton and the Trenton limestones. The latter she has been obliged to share with Indiana, but, so far as known, the Clinton formation is a source of oil and gas in Ohio only. But one gas field is to be credited to the formation at the present time, but this is a field of decided and economic importance and promise. It has a considerable area and its wells show good volume and high pressure.

The original discovery of the new horizon was not the result of the application of sound judgment or sagacity in any way, but it simply followed one of scores of ventures undertaken by Ohio towns in search of Findlay gas after its discovery in northwestern Ohio. The failure of almost all of these towns in their search was utter and unrelieved. Two that started out on exactly the same basis as the rest, and whose original task was a hopeless one from the beginning, succeeded in bringing to light a new source of gas, as unexpected as the Trenton limestone, but a thousand feet above it, in the scale. To Lancaster and Newark, fortune gave the right to lead the way. Starting, just as all the towns around them had, to find the Findlay gas rock, these two, at depths of 2,000 and 2,400 feet, respectively, below the surface, each reached a small supply of high pressure gas, which, from the record of the formations passed, and from the testimony of the drillings furnished, I was able to refer to the Clinton formation of Upper Silurian age. At this point in the search sagacity and experience were brought into play. To two gentlemen in particular, we are principally indebted for the subsequent development of the Clinton gas field, viz., to J. O. Johnston, a well driller and oil producer, and to John G. Deshler, a capitalist of Columbus. Mr. Johnston took note of the northeast line that seemed to be indicated by the experience of Lancaster and Newark. On this fact of structure he placed great reliance, and, as the result has shown, the reliance was not misplaced. A company largely influenced by the courage and confidence of Mr. Deshler was organized in Columbus, and proceeded to lease territory in large blocks between the towns above named on a line bearing north 20° east. When many thousands of acres of what seemed the most desirable territory had been covered, a test well was drilled at Thurston, half way between Lancaster and Newark. This well also found gas in the new rock, in moderate but promising quantity and under high pressure.

The point at which this well is located may be taken as practically the center of the Columbus supply. It is 30 miles distant from the city. The pipe line and the city service by which it is utilized are of the best construction. Gas was turned on in Columbus in January, 1890. During the following summer the company injudiciously undertook to furnish fuel to iron mills, brick kilns, lime kilns, and various manufacturing industries, and by the end of the year a serious failure of the supply then available was experienced, and gas was shut of from Columbus. But after the company got rid of its large consumers and the gas could be strictly confined to domestic use, and several new wells had been drilled and the selling price of the gas had been doubled, the valves were opened again in May, 1891. From that date to the present Columbus has enjoyed an uninterrupted and almost perfect supply. Even during the severe and prolonged cold of January, there has been little ground for complaint in any quarter of the city. At least half of our population are now enjoying the indescribable comfort and service of natural gas. In considerable sections of the city snow now lies in

yards as white as in the farmer's fields, where formerly the showers of soot of a single day would have blackened it beyond recognition.

Lancaster has for the last two years also enjoyed an abundant and thoroughly satisfactory supply of gaseous fuel. Its first wells were within the corporation limits, and none have been drilled as yet at more than two miles distant from the center of the town. The distribution was undertaken and carried on by the municipal corporation. The line was opened in 1888, and after an experience which was discouraging but educatory, several great wells have been brought in that have divested the problem of gas supply of all difficulty. Fortunately for the people of Lancaster, their earnest attempts to establish iron mills, glass houses, and other industries in the town, on the promise of free gas, have all, or mainly all, come to naught. Not having been able to persuade manufacturers to burn up the gas of the town in their factories without paying for it, they find it possible to enjoy the luxury of gas in their own homes, at rates which are at present far below the real value of the service.

Gas was introduced into Newark as domestic fuel by a private corporation in 1889. The supply reaches but a small part of the population, and even this restricted service has always been in a measure inadequate. The wells of the company are mostly situated within two miles of the town. The most distant are not more than 5 miles away. The rock pressure is fairly high, but the volume of the wells is comparatively small, the average daily production of the individual wells not exceeding 250,000 feet.

Extent and Character of the Clinton Gas Field.—With a brief description of the extent and characteristics of the Clinton gas field I will conclude this section of my paper.

The Clinton gas field, as at present defined, extends from Lancaster to Newark in a northeasterly direction, and with a length of about 25 miles and a maximum breadth, as thus far proved, of 2 or 3 miles. The underlying rock structure, upon which the gas field must at last depend, has not, I regret to say, been accurately made out. It is obvious, however, that a terrace or low arch is connected with the gas production. The central part of the field, in the vicinity of Thurston, is covered with heavy beds of drift, sometimes 300 feet in thickness, but both ends of the line extend beyond the boundaries of the drift. The gas rock in the Lancaster wells is reached at an approximate depth of 2,000 feet, in the Thurston wells at a depth of 2,200 feet, and in the Newark wells at a depth of 2,400 feet. The drilling of wells in this field is costly, principally on account of the occurrence of a strong vein of salt water near the bottom of the section, and which must be shut out by casing of unusual length.

The gas rock is neither regular in structure nor uniform in production, but the field is essentially a spotted one. About one-third of the wells that are drilled prove unproductive.

Salt water, presumably from the gas rock, is struck in wells of both Newark and Lancaster, but the central field has thus far been put to little trouble on this account. Oil appears but very sparingly, and no oil field of any promise has as yet come to light in connection with this great stock of gas. Compensation for the lack of uniformity in the gas rock is found in part in the independence of even adjacent wells in the matter of rock pressure. The rock pressures of the different divisions of the field do not fall together. A well may maintain 700 or 800 pounds pressure, while another one not half a mile distant from it may fall to nothing. The broken and irregular condition of the Clinton rock alluded to above is such as to obstruct the full efficiency of hydrostatic pressure on the gas contained within it. The highest rock pressure reported in the Clinton field is 800 pounds to the square inch, and this figure has been reached in but few wells. The full normal pressure, however, computed on the basis of the depth of the rock below the level of its nearest outcrops, should exceed this amount by something like 100 pounds.

In the volume of the wells there is a considerable range. None have been struck that produce less than 100,000 feet per day, but the largest wells that are found in the vicinity of Lancaster have yielded 7,000,000 or 8,000,000 feet a day. In the Thurston field the usual range is from 2,000,000 to 5,000,000 feet per day. The gas is superior in quality to that derived from the Trenton limestone, especially because of the smaller percentage of sulphur compounds that appear in it. It is also a better source of artificial light.

The wells of the Clinton group seem to have a fair measure of vitality. In other words, they show a good thickness of porous rock in which the gas lies compressed.

As to the duration of the gas supply from this horizon, it seems probable that Lancaster can maintain, with proper economy in use, a satisfactory supply for several years to come. It has no large acreage outside of the town, it is true, but the territory directly adjacent to the corporation has proved very prolific, and the gas trustees will no doubt be able to secure sites for wells at such points as would seem most profitable.

The Columbus supply gives excellent promise as to duration, by far the best of any town in Ohio. The company owns a large and practically unbroken body of gas land, and is thus able to protect itself against intrusion and the inevitable waste that follows promiscuous drilling. Better than this, however, it has mastered its business and learned the real nature of the form of wealth with which it has to do. It has made use of all available experience in the management of its field, its lines and its city service. It has no place for large consumers of fuel of any sort, but holds its store in trust for the only service to which natural gas ever ought to be applied, viz., household fuel. Like Goldsmith's villager, who went to church to scoff and stayed to pray, the company entered, no doubt, upon the business with the expectation of speedily reaping a golden harvest, as so many other companies that undertook the business did, but, failing in this, they stay in it to minister to the comfort and happiness of their neighbors. This they do in a far more effective way than any other business ever established in the city. Whether they do this of deliberate purpose or not, it is not necessary to inquire.

Spontaneous Combustion of Coal.

With respect to the ventilation of a cargo of coal, with the idea of removing inflammable gases, Professor Clowes, of Nottingham, has pointed out that this might itself be a source of danger. Four colliers were loaded with coal from the same seam, and by means of the same tips. Three were ventilated, and proceeded on their journey to Aden. None of these reached the port, being all lost by the spontaneous firing of their cargoes. The fourth was not ventilated, and it reached Bombay in safety. There was little doubt that the air inclosed in the cargo was insufficient to give rise to dangerous heating, and that the introduction of additional air by ventilation enabled the heating to occur by supplying the requisite air. Coal which had heated in the air and begun to cool again was safe from risk of further heating; hence, storing coal in the air for a sufficient length of time before loading was a precaution which would be calculated to insure the safety of the cargo.

The following practical conclusions were submitted as deducible from the facts presented: 1. The danger of spontaneous firing of coal in large lumps is very slight; it is much greater with small coal, and greater still with dust. The increase of danger is due to the larger extent of surface exposed to the air in proportion to the mass of the coal. 2. Air-dried coal which contains more than 3 per cent. of moisture is dangerous; if it contain less, the danger diminishes, as the amount of moisture is less. The moisture present in the coal is a measure of its absorptive power for air, and the most absorptive coal is the most dangerous. 3. The danger is somewhat increased by the presence of pyrites, in large quantity, not because this heats the coal to any appreciable extent, but because, when moistened, it swells—breaking up the coal, and exposing a larger surface to the air. 4. Newly won coal should be shielded from the air as much as possible, to prevent the chance of rapid heating, and for the same reason it is best not to stack it in large heaps, since these retain the heat. Ventilation of the coal often adds greatly to the risk of spontaneous firing. 5. All external sources of heat, such as steam pipes, boilers, and hot flues in the neighborhood of the coal, add very greatly to the risk of firing. Spontaneous heating becomes vastly more rapid when it is thus assisted by outside sources of heat.

The Latest Askins Gas Process Patent.

The latest U. S. patent granted to Mr. Joseph Askins, of Lima, Ohio, for "improvements in apparatus for the manufacture of water gas," is dated February 7th, and bears the number 491,398. Using the words of the specification:

The invention consists in the combination and arrangement of the several parts of a gas making apparatus, comprising a furnace or generator for the production of hydrocarbon vapors and gases, a water gas generator connected with the hydrocarbon vapor generator and receiving the hot gases and vapors therefrom, and a body of perforated tiles or checker brickwork, supported in the upper part of the water gas generator and forming therein a perforated fixing surface through which the vapors and gases from the hydrocarbon vapor generator are passed horizontally, and thus brought into contact with the ascending currents of water gas, whereby the mixture of gases is fixed by contact with the heated surfaces of said tiles or checker brickwork, and thence conducted to a scrubber or to a suitable gas receiver.

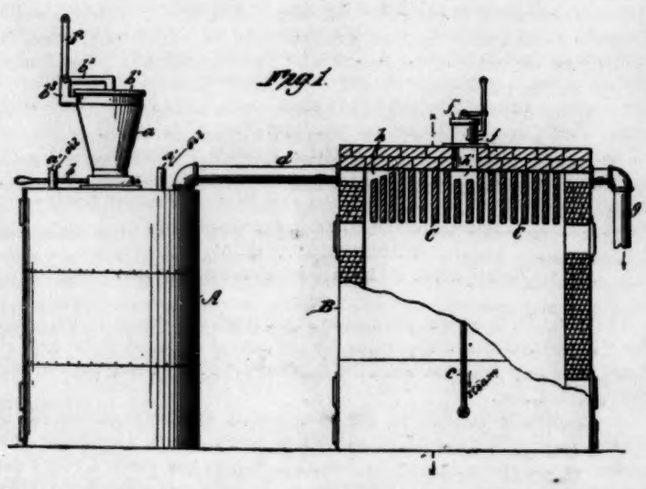
The invention also consists in the peculiar features of construction and novel combination of parts in a gas making apparatus as hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a broken sectional and side elevation of my improved gas making apparatus or plant, and Fig. 2 is a sectional elevation of the same, taken on the line x-x of Fig. 1. Figs. 3 and 4 are sectional views, taken at right angles to each other, of a modified form of my invention.

In the organization of the invention, I provide a suitable generator or furnace A, having a charging hopper a, at its top or upper end; and covering an opening in the bottom of said hopper, communicating with the chamber of said furnace or generator, is a hand actuated slide or valve b, to provide for the feeding or dumping into said chamber of the contents of said hopper, which is supplied with soft or bituminous coal. The oil is preferably fed or passed into the furnace through several pipes a^1 at the same time. The hopper a is also provided with a cover or cap b^1, to the center of which is fixed the lower end of the right angled fixed arm bx of a hand lever b^3, pivoted at its lower end to a bracket b^3 projecting from said hopper. The hopper, with its cap or cover closed, is thus adapted by withdrawing the slide valve, to permit of the feeding of its contents or coal into the furnace and yet prevent the escape thereat of gaseous vapors from the furnace.

B is a water gas generator arranged contiguous to the hydrocarbon vapor generator or furnace A, and having a suitable grate, upon which is built a coke fire to which steam is admitted by a pipe c connecting with a steam generator or boiler and said converter. This water gas generator, B, converter or fixing chamber has suitable connection by a pipe d with the furnace A at its top, and in said water gas generator are arranged, across the upper part of its chamber, tiers of tiles C, say say about 3 inches thick, built into the walls of said generator, and spaced apart at intervals say about 3 inches, opposite individual tiles or tile sections meeting centrally of said chamber as shown, and through and between these tiles the gases from generator A pass horizontally to the delivery end of the water gas generator, while the water gas and hydrocarbon vapors become commingled and fixed by exposure to the intense heat of the upper part of the chamber B in which said tiles are arranged. These tiles or tile sections are also provided or formed with perforations e throughout, to permit the passage therethrough of the commingled gaseous vapors from the furnace and the hydrogen gas, etc., entering the spaces or passages between said tiles or tile sections, whereby the gas is caused to pass over a greatly extended heating surface, while the tiles or heating surfaces themselves, by thus causing the heat to pass through the honeycomb like surface, into which the tiles or tile sections are thus converted, are quickly and thoroughly heated.

To permit the wholly unobstructed passage or entrance of the gaseous



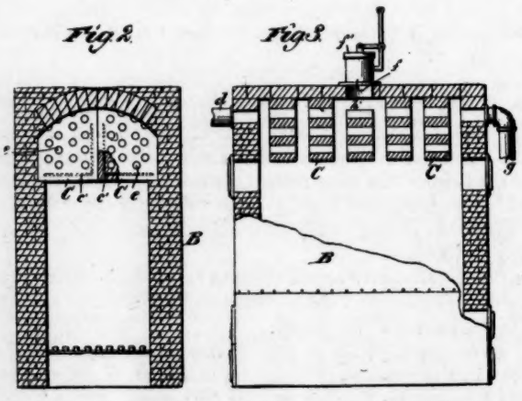
vapors from the generator or furnace through the pipe d, into the gas delivery end of said generator. The tile sections just opposite the outlet f generator, the tiles C are reduced or cut away as at h, just opposite the are also likewise reduced or cut away, as at h^1, for the unobstructed escape of the gas at that point during, as above stated, the initial heating of the converter.

In the top of the water gas generator B is an outlet f having a handled cover f^1 to provide for the escape, at the initial stage of the operation, or while heating up the converter, of the gas, said cover after this being closed. For the outlet of the fixed gas, a pipe g is provided, leading to the scrubber (not shown) or directly to the main to which the gas at this stage is conducted as usual.

The operation will readily be understood from what has already been stated, it only being necessary for the attendant to properly attend to the charging of the furnace A with the coal and oil or hydrocarbons, and to regulate the heating up of the generator B.

In the modification as disclosed in Figs. 3 and 4, I may use instead of the perforated spaced apart tiles, checker brickwork as shown.

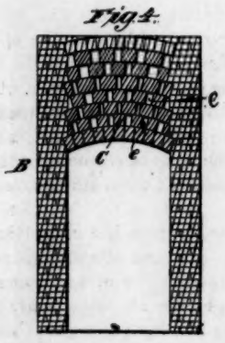
By employing the tiles in the manner described it is possible to dispense with the blast apparatus usually required in generators, and, further, the tiles or checkerwork can be heated in considerably less time



than usual, as it is in close contact with the fire and each side of the tiles is exposed to the heat, thereby effecting a saving of fuel.

The tiles are each preferably provided with a small metal rod c^1, which is embedded therein to prevent the tile from falling to pieces if it should crack.

In operating this gas making apparatus the drafts of the water gas generator B are opened while the said generator and the tiles C in its upper part are being heated, after which the cover f^1 is shut down. When the coke fuel in the generator B has become incandescent, steam will be admitted to the generator through the pipe c. The fire in the hydrocarbon vapor generator A is produced by the combustion of coal introduced through the charging hopper a. The hydrocarbon oil fed into the furnace A through the pipes a^1 becomes vaporized by the heat of the furnace and is mingled with the coal gas and volatile products of combustion. From this furnace or generator A the mingled hydrocarbon vapors and gases pass through the pipe d into the upper part of the water gas generator B in contact with the intensely heated tiles or brick checkerwork C through which said vapors and gases pass in a horizontal direction. While thus passing horizontally through the said tubes or brick checkerwork the hot hydrocarbon vapors from furnace A are mingled with the ascending water gas generated in the chamber B and



by contact with the intensely heated tiles the said gases become fixed before passing off through the pipe g to a scrubber or to a suitable receptacle.

With this form of apparatus the blast usually employed in the process of gas making is dispensed with, and by reason of the location and arrangement of the gas fixing surfaces or tiles, adjacent to the fire, they can be heated intensely in much less than the length of time ordinarily required for such purposes.

[Offical Report—Revised by the Secretary.]

TWENTY-THIRD ANNUAL MEETING OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Held at Young's Hotel, Boston, Mass., Feb. 15 and 16, 1893.

First Day—Feb. 15—Morning Session.

The President, Mr. William A. Wood, called the Association to order at 10:30 A.M.

ROLL CALL.

The following members responded to the roll call :

Honorary Members.

Thomas, J. R., N. Y. City. Benson, Col. F. S., Brooklyn, N.Y.

Active Members.

Africa, W. G., Manchester, N. H.
Allyn, H.A., East Cambridge, Mass.
Anderson, W., East Boston, Mass.
Anthony, A. C., Providence, R. I.
Bill, G. D., Malden, Mass.
Blood, F. C., Ware, Mass.
Boynton, D., Chicopee, Mass.
Bush, R. W., Dorchester, Mass.
Cabot, J., New York City.
Coffin, J. A., Gloucester, Mass.
Coggeshall, H. F., Fitchburg, Mass.
Cooper, A. F., Exeter, N. H.
Crafts, D. W., Northampton, Mass.
Davis, F. R., Athol, Mass.
Dye, N. C., Rutland, Vt.
Fowler, S. J., Springfield, Mass.
Gifford, N.W., New Bedford, Mass.
Gillmor, O., Norwich, Conn.
Goodno, G. F., Dedham, Mass.
Greenough, M. S., Cleveland, O.
Hassett, E. J., Beverly, Mass.
Hayden, W. H., Bath, Maine.
Hill, J. M., Concord, N. H.
Humphreys, C.J.R., Lawr'ce, Mass.
Jenks, Z. M., Woonsocket, R. I.
Jennings, F. W., S. Framingham, Mass.
Jewitt, Milton, Clinton, Mass.
Kelley, H. H., Waltham, Mass.
Lamson, C. D., Worcester, Mass.
Lane, F. H., Wallingford, Conn.
Lane, H. M., Leominster, Mass.
Leach, Henry B., Taunton, Mass.
Learned, E. C., New Britain, Conn.
Learned, W. A., Newton, Mass.
Long, R. J., Salem, Mass.
Manchester, G. L., Easthampton, Mass.
McKay, W. E., Boston, Mass.
Monks, R. J., Boston, Mass.
Neal, G. B, Charlestown, Mass.
Nettleton, C.H., Birmingham, Conn.
Norton, F. W., Nashua, N. H.
Norton, H. A., Boston, Mass.
Nutter, E. J., Milford, Mass.
Nutter, J. J., Milford, Mass.
Prichard, C. F., Lynn, Mass.
Quinn, A. K., Newport, R. I.
Richardson, F.S., No. Adams, Mass.
Rogers, J.F., Jamaica Plain, Mass.
Rossman, G. M., Keene, N. H.
Saville, L. A., Lexington, Mass.
Sherman, F.C., New Haven, Conn.
Slater, A. B., Providence, R. I.
Slater, A. B., Jr., Providence, R.I.
Snow, W. H., Holyoke, Mass.
Spaulding, C. F., Waltham, Mass.
Spaulding, C. S., Allston, Mass.
Spaulding, W. H., Clinton, Mass.
Spear, J. Q. A., Dorchester, Mass.
Stiness, S. G., Pawtucket, R. I.
Stratton, W. K., Haverhill, Mass.
Taber, R. B., Boston, Mass.
Tarbell, A. W., Waltham, Mass.
Tarbell, W., Waltham, Mass.
Thayer, W. F., Westfield, Mass.
Tilton, D. D., Newburyport, Mass.
Todd, J. R., Middletown, N.Y.
Wetherbee, G. E., Worcester, Mass.
Willard, A. R., Greenfield, Mass.
Wood, W. A., Boston, Mass.

Associate Members.

Brown, F. H., Waltham, Mass.
Coburn, C. M., Chelsea, Mass.
Cortis, D. T., Boston, Mass.
Davis, F. J., Waltham, Mass.
Gifford, C.H., New Bedford, Mass.
Greenleaf, C. H., Bath, Maine.
Hahn, J. W., Boston, Mass.
Holmes, R. E., Winsted, Conn.
Mace, F. W., Lynn, Mass.
Thomas, F. W., Boston, Mass.
Tobey, F., Jr., Rondout, N. Y.
Tufts, N. W. S., Boston, Mass.
Willard, C. E., Boston, Mass.

On motion of Mr. Nettleton the reading of the minutes of the last annual meeting was dispensed with.

Mr. A. B. Slater—Before we proceed to routine business I desire to say that the calling of the roll of members reminds us of those of our number who can never respond to their names again. At the same time there are those among us who were present at the original meeting, when this Association was organized, 22 years ago. Among them is one member who comes prominently to mind, and I think he is now the oldest member of this Association, and that is the Hon. George D. Cabot, of Lawrence. When we prefix the title of "Honorable" to his name it is no misnomer, for the name of George D. Cabot is the synonym of all that is honorable, upright, honest and worthy in human character. I would move that a telegram be sent to Mr. Cabot from the members of this Association, expressing our respect and kindly feeling towards him.

Mr. Greenough—I second the motion.

The motion was carried, and the Secretary subsequently sent the following telegram to Mr. Cabot :

Boston, Mass., February 15th, 1893.

To Hon. Geo. D. Cabot, Lawrence, Mass.: The officers and members of the New England Association of Gas Engineers, in annual meeting assembled, send greeting, and desire to tender to you their highest respect and kindly feelings. C. F. Prichard, Secretary.

New Members.

The following applications having been favorably acted upon by the Directors, on motion of Mr. Slater the Secretary was directed to cast the ballot of the Association for the election of the applicants, and they were declared duly elected, and were welcomed by the President to membership :

Active.

Thos. H. Heintze, Supt., Chelsea, Mass.
Jos. E. Nute, Supt. Fall River Gas Works Co.
Chas. D. Sherman, Asst. Engineer, New Haven, Conn.
Louis Bartlett, Supt., Cottage City, Mass.

Associate.

Walter S. Allen, Asst. to President, Bay State Gas Lt. Co., Boston.
Eugene Tufts, Tufts Bros. Meter Co., Boston.
Bankson Taylor, Supt. So. Boston Gas Light Co., So. Boston, Mass.
F. P. Addicks, Treas. Boston Gas Lt. Co., Boston.
Edward M. Darb, Mfg. of Gas Cocks, Providence, R. I.
Joseph P. Tufts, Tufts Bros. Meter Co., Boston.

Transfer From Associate to Active.

Chas. M. Gerdenier, Asst. Supt., Bridgeport, Conn.

PRESIDENT'S ADDRESS.

The President then read the following :

Gentlemen of the Association: In addressing you officially, I desire to thank you for giving me the opportunity of welcoming members and guests to our annual meeting. I would so emphasize the greeting that henceforth, when the New England Association says "come," none may question the old lady's sincerity.

Some of the invitations extended in previous years have been received in a manner which indicated that the recipients would feel more free to accept if our constitution possessed sufficient elasticity to permit of their coming as members rather than guests. This question has often been brought before the Directors and strongly pressed by friends whose names would be prominent on our active list should wisdom dictate an extension of our territorial boundary. That our constitution, or simple articles of agreement, have, with so few modifications, served us so well during nearly a quarter of a century, is ample reason why we should hesitate to amend.

The progress and growth of the Association to its present membership of 148 has demonstrated the wisdom of its founders, and convinced their successors that it should be maintained strictly a New England Association.

The guests who are with us to day know that they are as heartily welcome as the members themselves, and as free to participate in our procceedings. You have tried it before, and this portion of my address is not intended for you. All sermons to the absentees must be preached to the guiltless congregation, and over your faithful heads I send this official proclamation to all who question our hospitality. Come and be convinced.

The year has been one of prosperity. The reports of your officers will show a steady growth in membership, continued interest in our work, and a favorable financial balance. The published paper list presages an interesting meeting ; but congratulations must be tempered by sorrow.

Four of our members have died during the year. The Association honored itself when it elected George A. McIlhenny to honorary membership. He died October 16th, 1892. His face was not familar, to the younger members, but all have heard read his letters of inquiry as to our welfare, coupled with regret that physical disability alone prevented his attendance at our meetings. His regard for the Association was sincere and lasting. The story of his life has been so well told and the eulogistic words of his many friends are still so fresh in you minds, that anything I might say would but echo these testimonials to his worth as a man and engineer.

Mr. Edgar H. Woodman, the General Manager of the Concord, (N. H.) Company, died March 21st, 1892. Your Directors were unaware of his death until too late to send a tribute to his memory. He was held in highest repect in the community in which he lived, and I am confident you will to day assure his friends in that community of your regret at his loss and your appreciation of his worth.

Mr. Austin M. Copp, died November 1st ; with the death of his associate in business, Mr. Frederic H. Odiorne, which followed January 3rd, two men have passed away, who, in a business way and by direct

interest, were intimately connected with the New England gas industry. Though not a member of our Association, I trust that when a page in our records is set aside to the memory of his associate you will find it fitting that a proper tribute is due to the memory of Mr. Odiorne.

July 13th the heart of every member of this Association was saddened by the announcement of the death of Hon. A. M. Norton, of Nashua, N. H. It seems but a day since he served as your presiding officer. How well, you all know. His associates on the Board of Directors can testify that he labored for the welfare of the New England Association with the quiet zeal and forceful dignity which characterized all his actions, and won for him the esteem of all with whom he was brought in contact in the varied pursuits which he followed to success. With us it was more than esteem. His death means more than a silent voice at roll call. We have lost a friend—peace to his memory.

Ancient usage has demanded of your President a resume of the doings of the years and an attempted solution of all the prominent problems before us. As you are at present all of one mind regarding the great question of fuel gas, municipal lighting, gas versus electricity, and coal versus water gas, I prefer to ignore them at this time, and ask you to consider what we can best do to strengthen and improve the work of the Association.

Our territory includes five States, maintaining, according to published statistics, 137 gas companies. Of this number 5, out of 11, in Maine, 6, out of 15, in New Hampshire, 3, out of 8, in Vermont, 45, out of 75, in Massachusetts, 10, out of 21, in Connecticut, and 5, out of 7, in Rhode Island are represented in this Association. A total of 74, or a little more than 50 per cent. Why is this percentage not larger?

Twenty-two years ago your first President, Mr. W. W. Greenough, expressed the hope that that meeting might be the prelude to many others which should be fraught with interest and instruction, and which from the contributed wisdom of various departments of engineering might remove, or assist in removing, the difficulties lying in the path of every member. Is it too much to say that the wish has been more than realized? We know the meetings have been instructive and beneficial, and while some problems still remain unsolved, our records testify to 20 years of careful organized effort to overcome the difficulties encountered in our daily practice. I am moved to speak at length on the value of such associated effort, as the occupation of the position to which you have so kindly elected me has been the means of apprizing me that in this year of grace there exist men of official prominence in our industry who speak slightingly of the value of these meetings, and expressly prefer their superintendents and engineers should refrain from joining them. Their belief is founded, not on prejudice, but on ignorance. They honestly believe that the expense of attending the meetings is a needless waste, as all the proceedings are published, and he who pays his subscription may read. Such confession has been made, and I rejoice; for if the proceedings are read opportunity is afforded for enlightenment. If I am mistaken, I seek correction, but I feel that I voice the thought of every member, and speak for the Association, when I affirm that the most valuable part of these meetings is found in the *unpublished* proceedings.

The presentation of a paper often brings to the writer pleasant and valuable correspondence with eminent foreign and native engineers. The discussions closed at the meeting are reopened by letter, but better still are the meetings between the sessions. The quiet interchange of facts and figures between man and man. The swapping of items from the ready memorandum book. This is a feature which would appeal to our skeptical friend who feeds his superintendent on the printed page—if he will but attend one meeting, after the morning session we will introduce him to Henry and Sam. The interview will repay the expenses of the trip. He will find them pleasant gentlemen to meet, and when he learns that for six months past they have been receiving 50 cents more a barrel for tar than himself, and from the same dealer, he will be converted. Seriously, gentlemen, I believe that a little missionary work will increase the percentage of companies represented in the Association. Let each one do his part.

The difficulty of securing papers increases every year. My regard for the health and well being of our Secretary prompts the wish that the time is not far distant when the paper list will be abolished.

The plan outlined by one of your number at the last meeting of the American Association, suggests methods of work that will not only relieve your officers from the vexatious uncertainty of the paper bugbear, but will call into active service a large majority of the rank and file, who are now satisfied with appearing in the unpublished proceedings. Absorption without reciprocity is not exactly tyranny, but it demands tyrannical treatment. Consider the resolution of our entire membership into standing committees working on definite lines. Facts, figures and data now presented in a paper would be collected and digested by the committee. An annual report from a dozen such committees would afford mental pabulum for a three days' session. Facts and figures so secured would represent the concentrated wisdom of the whole body, but these should be preserved in convenient and permanent form. Without enlarging on this topic, I respectfully suggests, as a beginning, the appointment of a committee whose duty it shall be to prepare an index of our proceedings from organization to date. The highest praise is due the AMERICAN GAS LIGHT JOURNAL for the admirable manner in which our proceedings have been published, but, admirable as the record is, a search for data through the files is inconvenient, and it is to be regretted that our charter members did not from the beginning print them in book form. The preparation of the index would be a sufficient task for one committee. To another might be entrusted the compiling of a volume covering the first five years of our history. By assigning portions covering moderate periods to different committees, all working under the direction of the executive board to secure uniformity, our 25th anniversary would see a complete, compact set of proceedings in the hands of each member.

Again, we have not at present a complete list of our members. From each year's published list the names of those who nave died have been omitted. A complete list should bear the names of every member with date of admission, and a mortuary list with date of decease. An attempt was made to do this the present year, but it was found impossible in the limited time at the Secretary's disposal, and in fact it should not be expected of him without the co-operation of a committee. A list once prepared with blank pages for the addition of new names would serve for five years.

Gentlemen, I have endeavored to suggest an answer to the question which I asked myself a year ago, and which I have asked you to assist me in answering to-day—what can be done to improve and strengthen our Association? I regret that my recommendations are chiefly in the nature of suggestions, unaccompanied by a definite and coherent plan of campaign. It is much easier to say what should be done than to decide how best to do it. I have hinted at the possibilities in two directions. The larger possibilities in other directions will suggest themselves to your intelligence. Let us not be satisfied with things as they are. There is room for improvement, and in the search for better things I will endeavor to demonstrate that the weight of official dignity has not impaired my usefulness as a member.

Mr. Stiness—I move that the President's Address be referred to a committee of three, in order that the very valuable suggestions presented by our President may receive due consideration. On account of my ill health I ask that my name may be omitted from the committee to be appointed.

The motion was carried, and Secretary Prichard named the following committee: Messrs. M. S. Greenough, C. J. R. Humphreys and A. B. Slater, Jr.

(To be continued.)

Howlden's Plan for Controlling Gas Supply in Trains.

British Letters Patent (No. 6,783) were recently issued to Mr. E. F. Howlden, of Doncaster, England, for a plan of controlling the gas supply from a reservoir to the burners on a railway train, by means of apparatus connected with the gas reservoir and with the brake train pipe, and adapted to be operated by fluid pressure by placing it in communication with the brake train pipe.

For this purpose, each reservoir is provided with a pipe arranged to convey gas from the reservoir to the several burners of the carriages, and with a valve or regulator, and means for operating it by fluid pressure, so that the supply of gas from the reservoir to the burners may (whenever desired) be cut off, or regulated as required, by operating a suitable valve on the engine or some other part of the train. One way of carrying this out is to adapt the regulators to be operated by fluid pressure, and placed in suitable connection with a pipe to which fluid pressure can be admitted, or in which a partial vacuum can be created when it is desired to operate the regulators. Where the train is fitted with continuous or automatic brakes, adapted to be worked with compressed air or vacuum, the pipe in connection with the regulators is, when required, placed in communication with the brake train pipe, whereupon there will obtain in the pipe connected with the regulators a like fluid pressure or partial vacuum to that obtaining for the time being in the train pipe, thus operating the regulators as required. Where continuous or automatic brakes are not employed, the pipe in connection with the regulators has arranged in connection with it special means for altering the pressure in the pipe when required, to operate the regulators—for example, by steam or air, compressed by a pump or by a partial vacuum produced by any suitable means.

Asphalt of Trinidad.

[A report prepared by U. S. Consul W. P. Pierce at the request of the United States Government.]

It is quite a difficult matter to say what the market price of asphalt is at Trinidad, because it is subject to so many anomalous conditions. The original cost to the government or to the owners of the lands prior to the asphalt rage was substantially nothing, and the cost to those who have since purchased lands varies.

In respect to present dealers, very little if any pitch is sold in isolated quantities. The usual contract is for the owner or lessee of the land to deliver so much pitch at a certain price annually for a term of years. I should judge that those dealers who have contracted for La Brea land pitch within the last six months have had to pay somewhat more than the lake pitch is sold for to shippers to Europe, to wit, 28s. 6d , or $6.84 in local money, free on board.

The following itemized estimate per ton in respect to land asphalt is believed to be a fair approximation:

Price of pitch in the ground.....	$4 00
Digging, overlooking and cleaning	50
Carting	40
Loading lighters and loading ship.....	30
Lighterage from shore to ship.....	50
Contractor's profits, mercantile commission and all other expenses and losses.....	1 10
Export duty	1 20
Freight and insurance to New York.....	2 25
Total.	$10 25

When large quantities of asphalt are being handled or other favorable conditions intervene, this total could, of course, be reduced. It is a matter of public record, for instance, that the first cost of the asphalt taken from the pitch lake by the Trinidad Asphalt Company is only 40 cents per ton, and it can be dug more readily than the land asphalt.

I have heard it claimed that all the asphalt at La Brea is substantially one deposit, and that applying the designation of "lake" to only a portion of it is incorrect; but the only part that can be said to be like a lake is alone called the lake by the community.

The village is on an extreme point called La Brea Point; another extreme to the east is called Point d'Or. The lake is further inland, being southwest of these points and about a mile from them, and about two thirds of the way from Point d'Or to the opposite side of the peninsula. The lake has an elevation of 138½ feet, according to Wall and Sawkins, above high water, and on three sides the land slopes from it. It is circular in form, and covers, according to a government survey in 1886, 109 acres 9 perches, and it is believed to contain several million tons of asphalt. The geological report of Wall and Sawkins puts the maximum amount which can be expected to exist at 4,752,000 tons. Since this estimate several hundred thousand tons have been removed. The report mentions that the term "inexhaustible," applied to the lake, "has probably arisen from the circumstance of artificial cavities rapidly closing up, which may have led to the supposition of the substance being reproduced or generated as fast as removed; but it is essential to remember that every pound abstracted diminishes the remaining quantity by that amount." I believe from the information I have obtained that the contents of the lake have decreased in volume during the last decade, indicating that the supply, if it has one, is not equal to the drainage that is now being made from it.

Persons who have seen a large round pond, substantially dried up, with little strips of clear water irregularly intersecting its bed, here and there patches of vegetation, and a slushy looking place near the center with fish bubbles coming up, the entire bed blackish and uninviting, can form a very fair idea of the general appearance of this famous lake. An odor described to be like that of sulphureted hydrogen gas is emitted at the sloppy looking place called the "place of supply," where many gaseous bubbles appear. In passing over the lake one will see more or less of these little bubbles, and if he stoops down and catches the odor from them he will find it the same as the odor at the "place of supply" near the center. There are also over the lake more or less little swellings of different shapes and sizes, and I am told that the smaller of them (say an inch square) contain only gas, and that some of the larger ones (say a foot square) contain both gas and decayed vegetation.

There are a large number (say two or three dozen) land islands over the lake which would probably aggregate about three or four acres. They are covered with vegetation, and some of them support trees 20 or 30 feet high; but I am told these islands do not come up from the bottom of the lake, nor do they bear down any considerable distance into the lake. Mr. J. W. McCarthy, the local manager of the Trinidad Asphalt Company, informed me that he destroyed one of them, and the pitch under it rose to its own level, or the general level of the lake. A horse may be ridden on the lake and up to the "place of supply," and, under particularly favorable conditions, I am inclined to think he might be ridden through it.

It is difficult to give a very satisfactory description of this particular spot, and no two descriptions of it can be exactly alike, for it is never identically the same on any two occasions. In an open space, say fifty acres or more, in which there is no vegetation whatever, may be seen a zigzag, irregularly outlined spot, which undergoes constant change in shape and size (when I was there last and took a good look at it, it was bow-shaped and approximated an acre in size). It differs from the surrounding pitch in outward appearance, as freshly molded or bright lead would differ from lead of a duller and darker hue. All of this fresher looking pitch is softer than the pitch surrounding it; but on some of it, at the more distant edges, one may walk without sinking below the heel of his shoe, and I apprehend from appearances, and was so told, that it is only a matter of time for the outer parts to become indistinguishable from the body of the surrounding pitch. Within this particular area is located what is called "the place of supply," which is one or more spots where the pitch is always softer and where, in the hotter part of the days, the pitch, or rather the water surrounding the pitch, fairly boils. These soft parts constantly shift their position, and their fomentations undergo great change, seemingly regulated by the heat of the sun. I am assured by witnesses, whose word I can not call in question, that they have seen the "place of supply" when a person could not have walked into it, both on account of the intense heat and the probability of being engulfed. I have never seen it present so terrible an aspect. On one afternoon, when it was probably in about its usual state, in the hottest part of the day, I saw a man walk into it with impunity, and it only came up to the calves of his legs. He picked up a handful of the pitch and handed it to me. It was as pliable as soft putty, and I manipulated it without any of it sticking to my hands; but the water which oozed from it somewhat discolored my hands, and I was told that if I had continued the manipulation longer, till all the water oozed out, the pitch would have become sticky. Early one morning (eight or nine o'clock) I visited the "place of supply," and the man I had with me walked all over the softest spot without sinking deeper than his foot. At that time two carts containing barrels were being loaded with the "liquid pitch," and the process was to dig and pull it up with picks in lumps, which were put by hand into the barrels. I was told that in the hot part of the day the pick was dispensed with and the shovel used instead.

One of the cartmen pointed to a particular place, a foot or two square, where he said he had been digging that morning and which had filled up. The man with me stepped into this place and gradually sank nearly to his knees, but sank no further. I also noticed that this pitch, unlike that on the previous occasion referred to, stuck with considerable tenacity to the man's legs.

The little channels of water referred to constitute quite a relief to the view. These are quite clear and pretty. They vary in width; but, unless unduly swollen by rainy weather, they may be roughly estimated at two to six feet wide and, say, one foot to two feet deep, though in places the water is much wider and deeper. By these deposits of rain water the lake is divided into a great many irregular divisions. Several persons told me that it was their understanding that these little channels rose and fell with the tide, which seems unreasonable; but, as the opinion is entertained by some of the residents of the neighborhood, I submit it. The pitch comes boldly up to the water, but rarely, if ever, slopes gradually into it, but at the water's edge it is inclined to curve down abruptly, and under the water it does not promptly adhere to the pitch on the adjoining area.

It is understood that the pitch is in constant motion, and the theory has been advanced that each of these irregular divisions has a motion of its own. It would seem, from the appearances, that the water at the outer part of the pitch of the adjoining division has a very repelling effect on the advancing pitch, or else these several divisions of pitch do turn under and revolve respectively within themselves. But evidently the pitch yields in a marked degree to the influence of water. I noticed a little spot of water about six feet wide, which was probably three feet deep—a depression which, if not originally caused by the settlement of water on the spot, is kept in existence by the water. In other words, the pitch would doubtless find its own level were it not for the water. I am strongly inclined to think that the "place of supply" described above, if not the source of supply or generation, is a source of general

motion, the degree of motion lessening as it recedes from this center. The fact that there is a large area next around the "place of supply" on which no vegetation grows, and that (in addition to the well defined land islands) more or less vegetation is found as you approach the border, seems to indicate that the motion near the "place of supply" is too great for sufficient earth to accumulate on the surface to support vegetation.

* * * * * * * * *

As to what percentage of the entire shipments was land pitch and what percentage was lake pitch from 1851 to the present time it is impossible to tell. The facts justify the belief that prior to about 1860 nearly, if not quite, all of the pitch shipped was taken from the pitch banks at La Brea Point; but from about that time to the present the lake has furnished the bulk of the shipments. Mr. Douglas, though evidently a party to the arrangement perfected by Mr. Barber in the winter of 1879–'80, continued to work Point d'Or till June or July, 1882; and I think it quite likely, from the information I have obtained, that the Point d'Or pitch he had collected was not all shipped away before August, 1883, unless he shipped land pitch in this interim from La Cocagne, where it is alleged he continued to dig after he stopped digging at Point d'Or. But this does not exactly agree with the warden's officers' report hereinafter mentioned.

Prior to the arrangement perfected by Mr. Barber in the winter of 1879–'80, pitch was dug at a plantation called Bellevue, by the West India Shipping Company, but I am not informed as to how long a time (if any) that company continued digging there after that arrangement. I notice from the London *Shipping Gazette* and Lloyd's List of April 22, 1892, that one of the stipulations in the sale of that property by a Mr. Callender, on behalf of the West India Shipping Company, was that he (Callender) was not to ship pitch to the United States. The numerous shipments of Mr. Douglas of Point d'Or pitch, on the other hand, from 1879 to 1882, inclusive (I did not have the harbor master's record examined for any other years), were almost exclusively to Washington, D. C.

It is proper that I should observe here that Mr. Douglas, in petitioning against an increase of the export tax in September, 1885, would seem to convey the idea by the language he used, that he had shipped 19,400 tons of asphalt from Point d'Or in the three years from 1882 to 1884. But the evidence seems conclusive that none of the pitch he shipped was dug from Point d'Or after June or July, 1882.

He was charged with obtaining pitch from the lake, which was alleged to be against the special regulations referred to, and the charge was sustained. A letter from the assistant warden (R. Johnstone), at La Brea, dated March 16, 1886, and addressed to the colonial secretary, gives a statement of an employee of the lessees of the lake, withholding his name for prudential reasons, as follows:

"Since Mr. Douglas stopped digging at Point d'Or all the asphalt he has exported has been taken from the pitch lake."

The assistant warden adds to this his own statement, as follows:

"Having had charge of that district for five years, I am in a position to bear out his statement as regards the ceasing of the digging of pitch on Point d'Or; but, being uncertain as to the year when the digging ceased, I thought it necessary to visit La Brea and gather information from those who were connected with Mr. Douglas when he carried on his business himself. With this view in mind I visited La Brea on Saturday, the 13th, and ascertained that they ceased working at Point d'Or some time between June and July, 1882. This information I got from men who worked for Mr. Douglas up to the last."

It appears from one of the statements of Mr. Barber that he began using Trinidad pitch soon after July, 1878, and that he first purchased supplies from Mr. E. Burgess Warren, who had bought the same from the agents of Mr. Finlayson. I will add that Mr. Finlayson, so far as I am advised, was at that time dealing exclusively in lake pitch. Mr. Barber's statement also shows that in the spring of 1879 he bought from Mr. Douglas a cargo of *epuree* (boiled pitch). He also entered into a contract with Mr. Douglas to furnish him and his associates with pitch for a term of five years, with the option of renewing the contract twice for similar periods, being the entire term of Douglas's lease of Point d'Or. In the spring of 1879, Mr. Barber and his associates, as he states further, took a public letting at Washington city for 104,000 square yards of work "at the lowest price named by several competitors," which they completed. These circumstances, therefore, would strongly indicate that this work was done with land asphalt, as Douglas, up to that time, is believed to have shipped none other.

I think it can be stated with substantial accuracy that very little, if any, land asphalt was shipped to the United States from about August, 1883, to 1888. From 1888 to 1891, inclusive, Messrs. Thomas A. Finlayson & Co. have kept an account, and have kindly furnished me with the following figures:

Table Showing the Shipments of Land Asphalt.

	United States.		Other Places.	
	Crude.	Epuree.	Crude.	Epuree.
1888.....	5,620 tons.	1,905 tons.	600 tons.	1 ton.
1889.....	11,327 "	2,042 "	....	....
1890.....	16,460 "	880 "	....	....
1891.....	10,450 "	....	127 tons.	....

The custom house table of revenue receipts on asphalt will show (considering that the royalty, which is paid on lake asphalt exclusively, is 1s. 8d. per ton) that the shipments during the March quarters of 1891 and 1892 were as follows:

March Quarters.	Land Asphalt.	Lake Asphalt.
1891.....	4,050 tons.	23,454 tons.
1892.....	10,223 "	23,763 "

In collecting data for the preparation of this report I came across a published statement from Mr. John Cumming, to the effect that land asphalt from Point d'Or and Bellevue was considered very inferior to the pure lake asphalt; and I also came across another statement from Mr. Thomas A. Finlayson, now deceased, as follows:

"The crown lands in the vicinity of the pitch lake have large deposits of pitch easily obtainable and equal in quality to the lake pitch."

These two statements are particularly interesting, inasmuch as the highly respectable firm of A. Cumming & Co., of which Mr. John Cumming is the senior partner, is now engaged as the trusted agent of Messrs. Carter, Hawley & Co., of New York, in upholding the merits of the land asphalt, while the equally reputable firm of Thomas A. Finlayson & Co. (of which Mr. Thomas A. Finlayson at the time was senior partner) is the trusted agent of the Trinidad Asphalt Company, which is in active competition against the land asphalt. * * *

I have given all the foregoing details, as this report is intended chiefly for the consideration of the various city authorities in the United States who are now considering the relative merits of lake and land asphalt in connection with the letting of contracts for making streets. With this important matter in view, I thought it best to give too much information rather than too little.

I have tried to collect all the material facts, and if I have failed it has not been because I have failed to consult both sides to an active commercial controversy.

Had the department not called on me to make this report, I should probably not have undertaken to do so, for the reason, if no other, that several gentlemen of fine capabilities, some in the interest of the lake asphalt and some in the interest of land asphalt, and some, probably unbiased either way, have been here from the United States investigating the subject.

Examples of the Berlin Iron Bridge Company's Construction.

A firm, the construction work of which has taken a very prominent position in these days of sharp competition, when quality, as one of the results of fair trade, is likely to be as important a factor as cheapness once was, is the Berlin Iron Bridge Company, many examples of the work from which can be seen at different points in the country. Herewith we give two examples of the Company's construction, in the belief that both may be studied with profit. The first example, shown in the illustration indexed as Fig. 1, is the result of a photographic reproduction of the interior of the gas works room of the New Bedford (Mass.) Gas and Edison Electric Light Company. As the picture is so clear a representation of the situation to a gas maker, little technical description is necessary, save to remark that the roof, which is from the designs of the Bridge Company, looks to present a sort of insurance against loss by fire. The room is 32 feet wide by 50 feet long, and the roof, with its accompaniment of iron trusses and purlins, is sealed with corrugated iron. Ventilation is provided for by means of one of the Berlin Company's improved systems, the same running nearly the full length of the building. The ventilator system is arranged for sets of swinging iron shutters to each side, so adjusted that they can be operated separately or independently, one or all at the same time, thus securing the desired end under all atmospheric conditions.

The second illustration (Fig. 2), also from a photograph, shows the interior of the Lake Erie Engineering Company's new machine shop, Buffalo, N. Y., which is probably one of the finest and best equipped machine shops in the world. This structure, which also was from the plans and construction of the Berlin Company, is 50 feet in width from center to center of crane girders, with a wing on each side 28 feet in

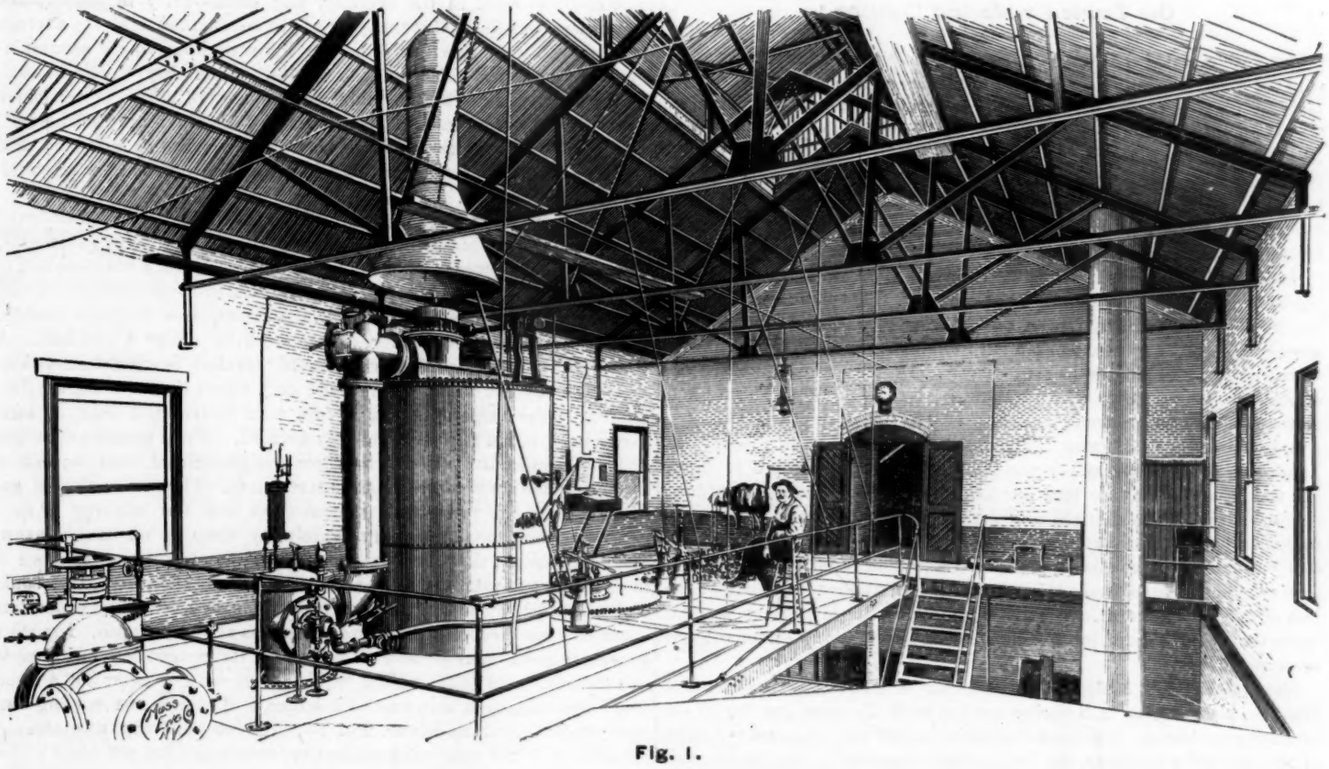


Fig. 1.

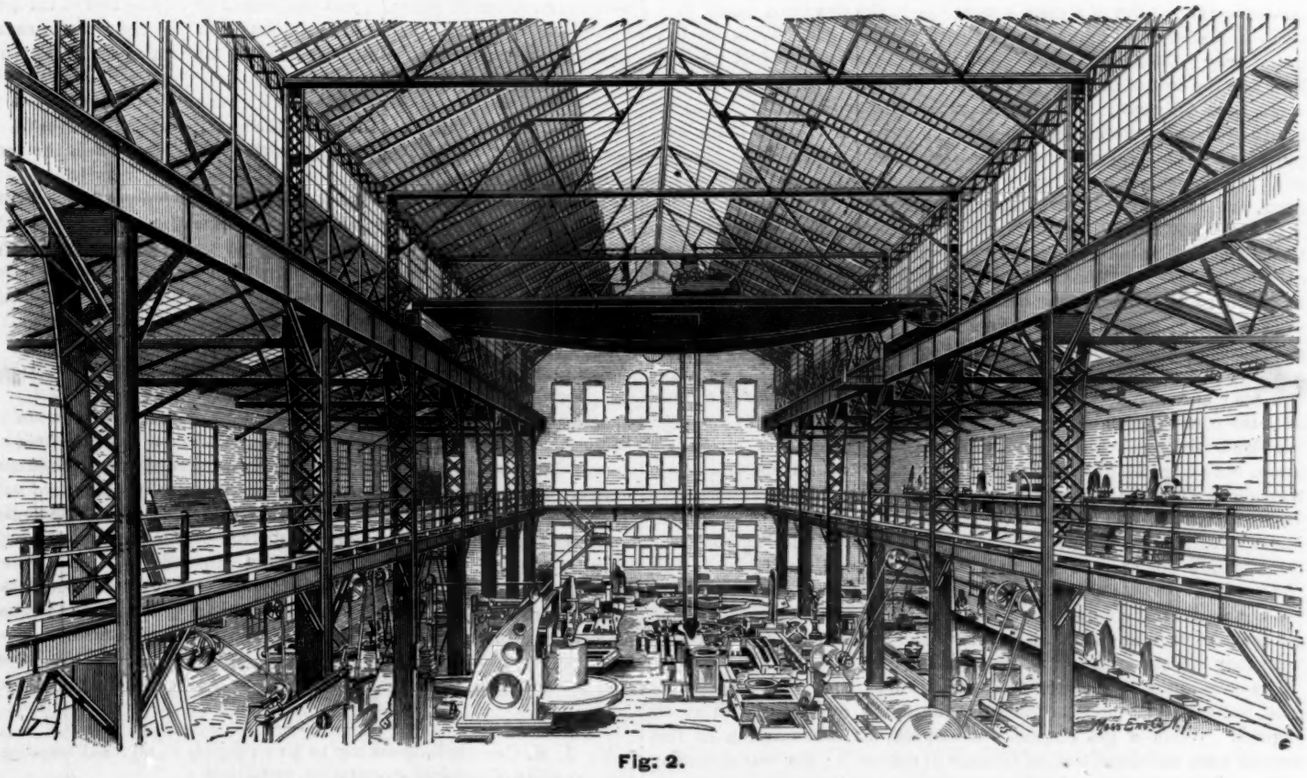


Fig. 2.

width, of two stories high. A power crane controls the entire floor surface of the central portion of the building, which is made high, so as to admit of being used as an erecting shop. The wings are controlled by jib cranes and are designed for lighter work in the second floor. The building is absolutely fireproof, as the walls are of brick, and the roof is of iron, slate and glass. The only woodwork in the construction of the building is the floors.

Particular attention is called to the lighting of the interior of this shop, as so many machine shops are lacking in this essential feature. Along the central ridge, the entire length of the building, is a skylight, 12 feet wide on each side of the center, which gives a well diffused illumination through the center of the building, and also on the second floor of the galleries. Light is also admitted by side windows, these latter being placed above the girders far enough so that the latter do not interfere with the free distribution of light. Skylights are are also provided in the roof of the wings on each side, being placed in alternate panels. These, taken in connection with the windows in the side walls, furnish ample and well diffused light through every portion of the building, causing it to be a place of comfort for the workmen and of admiration to the visitor.

Gas Power for Electric Lighting.*

The author stated that in Great Britain alone gas engines had been sold for electric lighting exceeding, in the aggregate, 7,000 horse power, and that in Germany engines were used for about 1,100 arc and 90,000 glow lamps. It was, however, only within the last few years that gas engines of large size had been before the world in a practical form. The varying load factor in central stations was a serious trouble, and the author hoped to show that much of the present loss due to fuel, water and wages would be avoided if gas power were used instead of steam power.

Special reference was made to the central station at Dessau, belonging to the German Continental Gas Company. That station was opened in 1886 with two 60 horse power, one 30-horse power, and one 8-horse power (effective) engines, worked with town gas, and all the dynamos were driven by belting and countershafts. In 1891 considerable alterations were made. One 60-horse power engine, with its belting and countershaft, was retained, and one of 120-horse power introduced, coupled direct to its dynamo. The speed of the engine and coupled dynamo was 145 revolutions per minute, and the consumption of town gas was equal to 39 cubic feet per kilowatt hour. Formerly, without accumulators, it was thought necessary to adjust the size of the engine to the supply, so that they should always be worked to their full extent. It had, however, been found that a limited supply could be more advantageously furnished entirely from accumulators. In spite of the loss of about 21 per cent. in the accumulators, large engines worked more profitably in parallel than smaller ones supplying direct without accumulators.

Since February, 1889, the Municipality of Schwabing, a suburb of Munich, had used an Otto engine worked with Dowson gas for 10 arc and 300 glow lamps. The load was variable, but, with an average output of 22.5 kilowatts per hour, the fuel consumption was 3.3 lbs. per kilowatt hour. The town of Morecambe was lighted by nine arc lamps and glow lamps, equal to 1,600 of 8-candle power each, the dynamos being driv en by Stockport gas engines worked with Dowson gas. With an output of only 1,155 kilowatts per week the consumption of fuel was 2.58 lbs., and the cost of the gas, including wages and fuel, was ¼d. per kilowatt hour delivered. At the chateau of M. Say, at Longpont, in the South of France, there were 650 glow lamps and one arc lamp, supplied by a dynamo driven by a Crossley engine worked with Dowson gas. The consumption of fuel was 1.2 lbs. per indicated horse power hour, and 2.7 lbs. per kilowatt hour.

It was believed that the late Sir William Siemens first drew attention to the fact that, when illuminating gas was burned in a gas engine to drive a dynamo, much more light was produced electrically than could be produced by burning the same quantity of gas in burners in the usual way. Latterly the consumption of gas per horse power hour in gas engines had been reduced, and the ratio was at the present time about 20 to 1 in favor of converting the gas into an arc light by means of a gas engine. The author had collected data from various sources as to the consumption of ordinary town gas by engines supplying elec tric light, with and without accumulators. The average of all the returns, with engines under varying loads and without accumulators, was about 47 cubic feet per kilowatt hour; when accumulators were used the consumption of gas was less, because the engines then worked under a full load. With 47 cubic feet per kilowatt hour, and 55 watts per 16-candle power, one light of that power required only 2.6 cubic feet per hour; whereas a standard argand burner required 5 cubic feet per hour. In this comparison it was assumed that the glow lamps and gas burners were in good order; but under ordinary working conditions they did not maintain so high a duty.

The question of load-factor was a serious one with any type of engine, but with gas engines the loss was much less than with steam engines. When a gas engine was stopped, its consumption of fuel stopped also, and there was no furnace to maintain; nor was there any water to boil at starting. At the same time, it was desirable that the gas engine should be worked as much as possible under a full load, and in this respect the experience at Dessau was generally confirmed. A central station was worked under trying conditions, and in the London district there was only a full output of current during from three to five hours in every twenty-four; moreover, about 60 per cent. of the total output was required during that short period. In practice, this meant that in a station where the current was supplied without accumulators, the engines were run at a reduced speed during a portion of the time, and at other times some of them were stopped altogether: but all had to be ready to work in the evening, and occasionally in the daytime when there was fog. Generally, it might be assumed that the average consumption was more than 6 lbs. per kilowatt hour where accumulators were used, and about 9 lbs. to 12 lbs. where they were not used. In any case, with the best possible arrangement of steam power, there must be a large amount of fuel consumed which did no useful work; for, even if some of the fires were drawn, they had to be relighted, and the large quantity of water which had cooled during the time of standing must be reheated.

The author believed that the solution of the difficulty was to be found in the use of gas plant instead of steam plant. With a large gas engine, 1 British horse power per hour could be obtained with a consumption of 1 lb. of anthracite, or 1½ lb. of coke; whereas the consumption of coal with the steam engines used for central stations, must be taken at about 2½ lbs. per British horse power, when working under a full load. A saving of not less than 50 per cent. could therefore be effected in stations where the engines were fully loaded; and, where there were great fluctuations in the output, the loss of fuel with boilers not used, or only partly used, could be almost entirely avoided. For a maximum output of 400 kilowatts, there would be three gas generators, each capable of supplying one-third of the maximum required. The production of gas could be raised or lowered in several ways, and the working of each generator could be stopped immediately, by shutting off its steam supply. Supposing, therefore, that all three generators were working at their maximum rate, and a gradual reduction was required, this could easily be effected; and, when the production of one or two generators could be dispensed with, their operation was at once stopped. The third generator could then be kept at work, and its production adjusted to suit the minimum consumption required. A gas generator had a small grate area compared with that of a boiler, and much less cooling surface; it contained no water, and required no chimney draught. A generator of the size referred to lost only 6 to 8 lbs. per hour whilst standing. If an average of only 40 per cent. of the maximum power were required for 21 hours, it was equivalent to letting two of the generators stand for that period; and at 8 lbs. each per hour that meant a total loss of only 3 cwts., compared with the much greater waste when steam power was used.

As the use of large engines, driven with generator gas, was of recent date, the author proceeded to describe the gas plant used, and gave the results of engines working regularly with Dowson gas, under the usual conditions obtaining in factories. He also gave the results of brake-tests made with several engines of large size, and reproduced indicator diagrams taken from engines of different makers. Although admirable results had undoubtedly been obtained from engines working with the Otto cycle, he was of opinion that, with engines of large size, the results would be still better if the cycle were altered, especially when generator gas was used. His reasons for this were fully stated in the paper.

The following was a summary of the points urged by the author: 1. When town gas was used for driving the engines of an electrical station, the consumption was about 50 per cent. less than the volume of gas required to give the same amount of light by ordinary burners. 2. When town gas was used, neither boiler nor fireman was required, and there were no ashes to remove; less space was needed; no accumulators were required, except such as might be necessary to equalize the load of the engines, and to provide for a small amount of storage. The engines could be worked in the most crowded districts, close to where the lights were required, and where boilers were not allowed. 3. When generator gas was used, the consumption of fuel under a full load would be at least 50 per cent. less than with steam power, and the loss due to steam boilers not being fully worked could be almost wholly avoided.

* Abstracted from a paper read by J. Emerson Dowson, M.Inst.C.E., before the British Institute of Civil Edgineers.

Free Wiring.

Mr. J. M. Campbell, speaking to this subject, at a recent meeting of the Canadian Electrical Association, remarked:

When arc lighting was first introduced in this country it was customary to put lamps and wires into the premises of the consumer free of charge. As the business increased and incandescent systems of lighting were introduced this practice was in a great many instances continued. The simple wires of the arc system multiplied in number and in size. The labor of installing plants increased greatly, a better insulation was called for, incombustible fittings and better workmanship were the order of the day, until at the present time if interior wiring for any incandescent system is put in properly, it requires good material and good workmen. Both of these cost money. In the face of all this, a great many of the local lighting companies wire up places

of business and houses free of expense to the owners, charge the outlay to "capital account," and post it up in their books as an asset. The stockholders at the end of the year very likely obtain a stock dividend and may consider themselves very fortunate if they are not called on to subscribe for a further issue of stock for extensions and improvements, unfortunately improvements to the property of others, and which if an asset at all to the lighting company doing the work, are of a very doubtful character—the kind of an asset which should be written off the books every year as a dead loss. Where do we hear of gas companies piping up customers' premises free of charge? This is seldom, if every, done, and yet in small towns the gas-making industry does not seem to be any great bonanza, and it is generally conceded that gas can be supplied cheaper than incandescent electric light.

No doubt when an electric lighting plant is installed in a town a greater number of customers can be obtained by supplying all interior work free of charge, but when this is done the company is at the mercy of the consumer. On the slightest pretext the company is ordered to take out the lights and wires by the consumer, who has no financial interest in the stuff, and the company's asset of so many lights wired up becomes a scrap heap of very little value. If the customers put in their own interior work, it saves a large outlay to the company in the first place. They then have an interest in it and will not be inclined to cut off the current without good reason. When pay-day comes around the collector will find that he has a different man to deal with than our friend with the free wires. By abolishing free wiring a better class of customers will be secured. The lighting company's expense will be cut down considerably, as all changes and repairs can be charged for. There will not be so much capital invested, and therefore less dividends to pay, and on that account a cheaper service can be given. Give the people a perfect service at as low a figure as possible, and make them pay for everything inside of, and including the main line cut out.

The company may not secure quite as much business, but it will show a much greater net gain at the end of the year. The business will increase much quicker than the capital account, and by and by when a street circuit must be extended or a new dynamo put in, the money will be on hand which would otherwise have been squandered on free wiring.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE following letter was received at too late an hour to permit of the publication of the same in our issue for last week:

ST. LOUIS, MO., Feb. 8th, 1893.

To the Editor AMERICAN GAS LIGHT JOURNAL: Having replied to Mr. Miller's letter referring to my article on the Harris process, I overlooked the profound criticism of the party masquerading behind the *nom de plume* "Bois." To begin with, "Bois" wilfully misquotes me, as "Harris gas" and "fuel gas" are not mentioned by me as synonymous terms. Having shown in the reply* previously mentioned where the 432.64 heat units came from, this need not be repeated. Having stated who my authority was for the analysis of natural gas in the article by me in the JOURNAL for Jan. 30, "Bois" can hunt it up and need not be in any doubt about it. I fully agree with "Bois" that it makes quite a difference whose gas it is, and how it is figured upon, to determine the result. We may add to that, it also makes a deal of difference who does the figuring. It is to be regretted that "Bois" did not carefully read the article he undertakes to criticise, as one result he would then have arrived at would have been that the author did not pose as the champion of the Harris process, but gave the result of his observation merely in an unprejudiced spirit. The attention of readers was called to the lack of proper appliances to thoroughly test this gas, and a careful reading of my article will acquit the writer from the aspersions of "Bois." If, however, it is wrong to believe in the future of gas for fuel, then write me down guilty. Yours truly, FREDERIC EGNER.

AT the annual meeting of the Gas Light and Coke Company, of New Albany, Ind., the following officers were elected: Directors, Messrs. S. A. Culberson, J. K. Woodward, Sr., George H. Devol, Jas. W. Dunbar and J. K. Woodward, Jr.; President, J. K. Woodward, Jr.; Secretary and Treasurer, James O. English; Superintendent, J. W. Dunbar. The Company had a very prosperous year, and Brother Dunbar proposes next season to keep up the crusade in the matter of introducing gas for fuel uses.

THE Western Gas Construction Company, of Fort Wayne, Ind., has been awarded the contract for the construction of the auxiliary water gas plant at Richmond, Va. Work will be commenced thereon immediately. Now that the matter has been definitely settled, we might say (and everybody who is at all conversant with the circumstances of the Richmond plant will assent to the remark) that the improvement most needed on the works is the construction of a storage holder of not less than 600,000 cubic feet capacity. Such an addition has been an actual necessity at Richmond for at least five years.

AS will be seen from the following action of the Board of Directors of the Macon (Ga.) Gas Light and Water Company, Captain J. W. Wilcox will sever his connection with the Company as its Superintendent on March 31st:

MACON GAS LIGHT AND WATER COMPANY,
MACON, GA., January 16th, 1893.

Capt. J. W. Wilcox, Supt. Macon Gas Light and Water Company—Dear Sir: At a meeting of the Directors of this Company, held to-day, it was decided that it was necessary to reduce materially the expenses of the Company, whereupon it was resolved that after March 31st next the Company would be obliged to dispense with your services. I am directed by the Board of Directors to say to you that it is with great reluctance and hesitation that they take this action, and that nothing short of the financial needs of the Company would induce them to do so. And to say to you further that the Company fully realizes the value of your services, as well as your ability and integrity, and that nothing could induce the Company to part with you except the demands of economy. With feelings of the highest regard for you personally, I am very truly yours, J. B. HALL, Secretary.

WHILE we have no inside knowledge as to the above, we do know that the Macon Company's business is such that its works' end cannot be thoroughly controlled and directed by an engineer who would be willing to accept a small salary; and, knowing this, a trifle of speculation as to the between-the-lines portion of the letter points to the active assumption of engineering duties by the President, Mr. Arthur E. Boardman, who in the earlier days of the Company was its works' man. If that presumption is the correct one, it is easily seen where the economy can be effected by dispensing with Captain Wilcox's services, and the Company still be operated, as to its manufacturing and supply divisions, by a thoroughly competent engineer. No doubt the wreck and ruin work of the days when the plants were at the mercy of the Philadelphia schemers has left its mark, and it is such ravages that cause the now owners to face the necessity of economy and hard toil. We are sorry that Mr. Wilcox is an innocent sufferer, but if his going out means the return to active duty of Mr. Boardman, some compensation is made. We hope that our study of it is true.

IN the meantime, we take it, Capt. Wilcox will not be long out of the ranks, for he is a thoroughly trained engineer, a conscientious director of labor, and an upright gentleman. And in so saying we voice the sentiments of those who know him best. The Macon *Telegraph*, of the 7th inst., in noting the fact that the Captain was about to terminate his relations with the Company, had this to say respecting him: "* * * Captain Wilcox was recognized by everyone as the most courteous and accommodating man ever before the public in an official capacity. To him more than to anyone else is due the perfection of the Macon water works system during its best days. Captain Wilcox developed most of the splendid springs south of the city, which gave Macon for a long time unquestionably the finest system of water works in the State. During the terrible trouble and long continued struggle for life with bad water and lack of water, Captain Wilcox was throughout untiring in his efforts in behalf of the people and of his Company. It is understood that Captain Wilcox does not contemplate leaving Macon, but will remain here as a consulting and contracting engineer. As is well known, Captain Wilcox is one of the finest engineers in the country, and will meet with abundant patronage."

AN item in a Washington (D. C.) newspaper of recent date is as follows: "At the regular meeting of the Directors of the Georgetown Gas Light Company, Mr. John Leetch, who for the past eight years has held the Presidency, has resigned that office to become General Manager of the Washington Gas Light Company. Mr. H. C. Winship, General Manager of the Chesapeake and Ohio Canal Company, was elected in Mr. Leetch's stead, his term of office to begin March 1. The position that Mr. Leetch will take with the Washington Company is a newly created one, the duties attendant having heretofore been performed by its President. Much regret was expressed by the Directors at Mr. Leetch's resignation, as during his Presidency the Georgetown Company

* See JOURNAL, Feb. 13, p. 318.

has been in a most flourishing condition, its stock having greatly increased in value and its plant having greatly improved."

MESSRS. ROBERT E. MORRISON, W. A. Martin and E. F. Michael, all residents of La Porte, Ind., have succeeded in acquiring the capital stock of the La Porte Gas and Coke Company. The proprietors intend to expend some money on betterments, and will go on therewith as soon as the weather conditions permit.

THE new electric station of the New Bedford (Mass.) Gas and Edison Light Company is in working order, and the old or Middle street station has been closed down.

AT the annual meeting of the Greenwich (Ga.) Gas and Electric Light Company the following officers were chosen: Directors, N. G. Rogers, R. J. Walsh, Edward F. Peck, James F. Walsh and John Dayton; President, N. G. Rogers; Vice President, E. F. Peck; Secretary, J. F. Walsh.

A BILL has passed the New York Legislature which authorizes the authorities of Ellenville, N. Y., to purchase and operate the local gas plant.

AT the annual meeting of the New Britain (Conn.) Gas Light Company Messrs. George M. Landers, L. F. Judd, J. H Eddy, A. J. Sloper and H. E. Russell, Jr., were elected a Board of Directors. It was also voted to declare a semi annual dividend of 3½ per cent.

THE gas works at Upper Mills, N. Y., which is a suburb of Utica, were destroyed by fire a fortnight ago. The plant was owned and operated by the proprietors of the factory known as the Middle New York Mills.

THE proprietors of the Williamsport (Pa.) Gas Company have filed a bill in equity against the Keystone Fuel Gas Company—a concern that proposes to supply gas in opposition—asking that the latter be restrained from manufacturing gas. The Williamsport Company claims to have the sole or exclusive right to the territory in question, and the contention seems to be soundly based, for the 9th clause of its incorporation act reads as follows: "The privileges granted by this act shall be exclusive, upon condition that the said Company shall continue without unnecessary or unreasonable interruption to supply said borough and the inhabitants thereof with good and sufficient light (except in case of accidents) from the gas manufactured by said Company at the rates hereinbefore mentioned. Provided, nevertheless, that said Company shall not be required to lay down pipes for conveying gas to any portion of said borough or its vicinity, unless in the opinion of the managers such portion contains a sufficient number of consumers to warrant the expense." In further evidence of this exclusive right the Company submits that it has filed a certificate accepting the provisions of the general incorporation act of 1874, under certain clauses of which it is specified that in any district of the State in which a gas company exists "no other company shall be incorporated for a similar purpose until said corporation shall have realized from its earnings and declared a dividend, for five years, an amount equal to 8 per cent. per year of its capital stock." This the Company has not done. The case is likely to attract a good deal of attention.

THE incorporators of the Keystone Fuel Gas Company are Messrs. J. A. Reeber, Charles R. Harris, G. Hess, P. B. Shaw, A. D. Hermance, G. D. Tinsman, Q. S. Backus, J. B. Coryell and W. N. Sloan. It is capitalized in $100,000.

AT the annual meeting of the Washington (D. C.) Gas Light Company the following Directors were chosen: Messrs. John R. McLean, William B. Webb, James W. Orme, John C. Bullitt and George J. Dunlop. It is reported that some of the management favor a movement putting the gross rate for gas at $1.10 per 1,000, with 10 cents off for prompt payment, and we believe that such a move would save the Company much expense and annoyance, while it would undoubtedly not cause any permanent curtailment of its revenue.

THE idiotic bill introduced in the Massachusetts Legislature, under which it was sought to prevent anyone who had been connected with the Massachusetts State Board of Gas and Electric Light Commissioners, either in an administrative or clerical capacity, from taking service with a gas company until five years "shall have elapsed since said service or under said Commission," is defeated. The petitioners were granted leave to withdraw it.

THE Knox Gas and Electric Company, which has been incorporated with a capital of $200,000, is a result of the union of the interests of the Rockland and Thomaston (Me.) Gas Light Company, the Camden and Rockport Electric Light Company, and the Thomaston and Warren Electric Light Company. Its President is Mr. G. E. McComber, and Mr. A. D. Bird is Treasurer. Mr. Galen C. Moses, President of the Bath (Me.) Gas and Electric Company, is largely interested in the venture.

THE Chicago Gas Light and Coke Company will discontinue the use of oil as fuel at its various stations, and substitute coal therefor.

THE New York Legislature is now wrestling with a bill introduced in the Assembly by Mr. Kerrigan, under which it is proposed to put the rate for gas in New York city at $1 per thousand. The matter is before the House Committee on Gas, Water and Electricity, and at least one hearing has been had, at which representatives of the Equitable, Standard and Consolidated Companies were present. Mr. Kerrigan is on record as having said during a hearing that the Companies could declare dividends if the rate were put at 80 cents; which goes to show what an ass a "legislator" can make himself. "Hearings" are not what that precious committee most desire; "seeings" would be vastly more to their liking.

MR. KELLY, of the Assembly, also asks the State to direct that the salary of the New York Inspector of Gas Meters (Anthony Clinchy) be fixed at $5,000 per annum; also, that the State Inspector be allowed three deputies (to reside in Brooklyn, Albany and Buffalo, respectively), the annual salary of each to be not less than $1,500.

WE are indebted to Mr. Edward Abend, President of the Belleville (Ills.) Gas Light and Coke Company, for the information that his Company has purchased the plant and franchises of the local enterprise known as the Brosius Electric Company, and that both concerns will be operated hereafter in harmony. The plant of the electrical concern was in very inefficient condition, and President Abend, after an inspection of the same, decided that it would have to be virtually renewed, whereupon an order for the necessary machinery was at once placed. The consolidation was effected on terms very favorable to the purchasers, the latter in reality having secured the property at figures of their own framing. The low gas rate at Belleville ($1.35 per 1,000) is the leader to the collapse of the Brosius concern, and the Gas Company has no intention of trying to develop the electric end of its business at the expense of the division which has hitherto proved its mainstay. President Abend is not much of a believer in phantoms as a source of profit.

SUPPLEMENTING our brief "note" of last week, respecting certain changes in the management of the Middletown (N.Y.) Gas and Electric Light Company, which is again under control of local capitalists, we add that the following officers were elected to represent the changed capital conditions: Trustees, Albert Bull, C. Macardell, L. C. Purdy, Henry W. Wiggins, J.W. Canfield, G. T. Townsend and M. D. Stivers; President, Albert Bull; Vice-President, L C. Purdy; Treasurer, C. Macardell; Secretary, Garrett T. Townsend. Mr. J. R. Todd, of course, was retained as Superintendent. Mr. H. K. Wilcox, who acted as Secretary of the Company for many years, has disposed of all his interest therein. An auxiliary water gas plant will be installed, and important main extensions will also be made.

"S. J. R." FORWARDS the following from St. John, New Brunswick: "Towards the close of last month, Judge Burbridge, of the Exchequer Court, handed down his decision in the suit entitled 'The Queen against the St. John Gas Light Company.' The defendant had been permitting the drainage from its works to flow into the harbor, which caused the Overseer of Fisheries, Mr. A. O'Brien, to complain that the refuse matters were polluting the waters, whereupon the city asked to have repealed the Provincial laws authorizing the Company to open its drains at certain stages of the tides. An injunction in perpetual restraint was asked for, but this was denied, the denial being founded on a concession made by the Company, which is to the effect that the drainings will be allowed to go into the harbor waters at 'ebb tide, or at such other times as the City Council shall direct.'"

PHILIP TYLER, who lives at 318 North Holliday street, Baltimore, Md., was a consumer of gas in the regular way until last July, when his meter was removed for non-payment of gas bills. He, however, contrived to connect the street service pipe and his house pipes by

means of rubber tubing, and so managed to secure a free supply of gas, until a day in December, when his game was brought to light by an inspector. On being confronted in court by his accusers he pleaded guilty, and Judge Harlan fined the culprit $30.

It was reported that the works of the Spokane (Wash.) Gas Light Company were about to be removed to the north side of the city, but Mr. H. C. Thompson, the clever and painstaking Manager of the Company, who certainly ought to know whether there was any fair basis for such a rumor, denies that such a scheme is in the possibilities.

The new electric plant of the San Bernardino (Cal.) Gas, Electric Light and Power Company is in good working order.

At the annual meeting of the Shenandoah (Pa.) Gas and Electric Light and Heat and Power Company the officers chosen were the following: Directors, J. S. Callen, John M. Robbins, P. J. Gaugham, L. J. Wilkinson, S. J. Kistler, H. W. Titman, George W. Beddall and H. A. Swalm; President, Dr. J. S. Callen; Secretary, Dr. S. J. Kistler; Treasurer, George W. Beddall; Superintendent, H. W. Titman.

The shareholders of the Amherst (Mass.) Gas Light Company have at last determined to overhaul the affairs of that corporation in thorough fashion, Messrs. Charles Duel, C. H. Fernald and Frank E. Whitman having been appointed a committee to make an "exhaustive examination of the Company's business, its financial needs and condition," and the committee was further directed to hand in the results of the examination at a special meeting, which was set for Saturday last.

The Consolidated Gas Company, of this city, has filed with the building department the plans for a brick structure, to be located at 144th street, close to Third avenue. The cost of the structure, which is named in the application as a "shop," is put at $50,000. It will be noted the location is quite a fair distance north of the Harlem river.

In our item columns for last week (p. 227), we published an inquiry from "H.," who sought information that would enable him to keep in duty for a few more months a holder, the crown of which is not in good condition. The first reply to the inquiry is appended:

Bayonne and Greenville Gas Light Co.,
Bayonne, N. J., Feb. 13, 1893.

To the Editor American Gas Light Journal: In your issue of February 13th, "H." asks a question in relation to stopping leaks at the seams in the top of a holder. I have had some leaky seams in the relief holder, directly over the inlet pipe, that have been quite a job to keep tight. Owing to the vibration of the crown caulking has been of no avail. I tried all sorts of cements, but none would do until I tried common building cement (say Rosendale), mixed with metallic paint to the consistency of stiff putty. I have since used it on the storage holder and find it does its work admirably. Its virtue is in not getting hard as soon as other cements made of litharge, manganese or red lead. In fact, I have found it quite plastic, after three months' application, and that in cold weather. Yours respectfully, W. H. Smith, Supt.

The Woonsocket (R. I.) Gas Company sent out 4 millions cubic feet more gas in 1892 than in 1891—a very substantial gain, since it represents an increase of something over 11 per cent.

The following outrageous bill is before the attention of the New Hampshire Legislature: *Section 1.*—No person or persons, corporation or corporations, now or hereafter chartered for the purpose of making or selling gas for illuminating or other purposes, in cities having, according to the latest census, a population of 10,000 inhabitants and over, shall charge more than $1 per 1,000 cubic feet for gas, to be used either for illuminating, cooking, heating or other purposes for which the said gas may be used, and said gas shall not be less than 25 candle power. *Section II.*—It shall be the duty of the Mayor of any city of 10,000 inhabitants and over, within 10 days after the passage of this act, to inform any person or persons, corporation or corporations, manufacturing or selling gas for illuminating or other purposes in any city in this State, now or hereafter coming under the requirements of this act, as to the requirements of the act. *Section III.*—Any person or persons, corporation or corporations, refusing or neglecting to conform to the requirements of this act for a period of 30 days after having been notified by the Mayor of said city, shall forfeit all rights, privileges, charter or charters, franchise or franchises, granted or to be granted by this State; and the Attorney General is hereby authorized and directed to appeal to the Courts for injunction restraining said person or persons, corporation or corporations from carrying on business in any city, now or hereafter coming under the requirements of this act. *Section IV.*—All acts or parts of acts inconsistent herewith are hereby repealed. *Section V.*—This act shall take effect upon its passage.

If this measure, which might rightly be considered a confiscation edict, ever becomes a law, the inevitable result will be the closing down of every gas works affected by its provisions; for the selling rate named is (save in two instances, possibly) less than the cost to the companies of manufacture. Another feature of the iniquity is its marked resemblance to the rate bill introduced in the Massachusetts Legislature by Mr. Hoar, a copy of which will be found in our item columns for January 30th, page 156. In fact, there can be no doubt about it that the one is but a reproduction of the other, in every essential detail.

The Worcester (Mass.) Society of Civil Engineers, by invitation, recently inspected the works of the Worcester Gas Light Company. The President of the Society, Mr. Arthur J. Marble, headed the visiting delegation, who were received and shown over the plant by the Company's Superintendent, Mr. G. E. Wetherbee.

A bill recently introduced in the Pennsylvania legislature bears in its title the information that it is designed for the "supervision of companies supplying natural or artificial gas, or electricity for light, heat or power." It provides for the appointment of seven State officers, to be know as inspectors. Of these one is to be designated "Chief," whose salary is to be $4,000 per annum, and he is to have power to name his six co-workers (salaries of each to be $2,500), one of whom shall be a chemist and one an electrician. The duties are to be the inspection of the purity and the candle power of the gas supplied, the testing of the lighting value of arc and incandescent lamps, the testing of gas meters, etc. The bill also declares that the main offices of the bureau shall be in Philadelphia and Pittsburgh, and that the entire expenses of the bureau shall be borne by the companies under supervision, the assessment of each to be determined pro rata from the annual gross receipts. The bill also directs that the maximum rate for manufactured gas shall not exceed $1.25 per 1,000; for natural or "fuel" gas, 22½ cents; and "for electric energy, 17 cents per Pennsyvania unit," the determination of said unit being also arranged for in the bill. It is also set forth that henceforth "no more than one Company shall operate in any one district."

The incandescent electric lighting equipment for the Whitehall (N.Y.) Gas Company is about completed.

We understand that Messrs. Cole and Everhart have secured control of the Somerville and Raritan (N. J.) Gas Company.

Mr. W. H. Elliot has been elected Vice-President of the Keene (N.H.) Gas Company. This is a new division in the executive management.

New Method of Preparing Filaments for Glow Lamps

The Buda-Pesth Incandescent Lamp Company has introduced some marked modifications in the manufacture of incandescent lamps. The uncarbonized filaments of wood, cotton, or other vegetable fiber are first immersed in a bath containing 25 to 30 per cent. of potassium silicate, 10 to 15 per cent. of gum arabic, and 12 or 13 per cent. of caustic soda. After removal they are rolled to the section of an angle iron, which is said to give a strong filament with a considerable superficies. The filaments are then carbonized, after which they are mounted and placed in a bath of melted paraffine or naphthaline. After the latter has become solid by cooling, a current is passed through the filaments, melting and vaporizing the paraffine in their immediate neighborhood, and causing a deposit of carbon, as in ordinary flashing. It will be seen, however, that by this method the carbons can be standardized before being placed in their bulbs. Liquid paraffine is said not to work, as convection currents are then established in the bath, which bring all the oxygen entangled in the bath in contact with the filaments sparking them. The solution in which the filaments are soaked before carbonizing is said to protect them during carbonization, and to give them a uniform surface, on which carbon can be deposited during the flashing process. The gum arabic is also beneficial, the filaments being stronger after carbonization when it is used. When the resistance of the filaments has been brought to the proper point by the flashing process, they are removed from the bath, and any excess of paraffine or naphthaline sticking to them is washed off with alcohol.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

EDITOR—Jos. R. Thomas, C.E.
ASST. EDITOR—T. J. Cunningham.
MANAGER—C. E. Sanderson.

TERMS:
SUBSCRIPTION—Three Dollars per annum, in advance. Single copies, 10 cents.

PUBLISHED ON EACH MONDAY OF THE YEAR AT
No. 32 Pine Street, New York.

AGENTS
NEW YORK.—AMERICAN NEWS Co., 39 and 41 Chambers Street.
Germany.—B. WESTERMANN & Co., of New York.

MONDAY, FEBRUARY 20, 1893.

The Market for Gas Securities.

Consolidated sold up during the week to 136, but towards the close the rate declined to 133, which was the opening figure to-day—Friday. Other city shares were dull also. No doubt the drop resulted from the unsettled feeling regarding the outcome of proposed legislation on the price of gas in the city, but it is more than likely that dollar gas is not yet at our doors. In the meantime an effort to procure something in the shape of a gas commission for the State is underway, as is also an attempt to secure legislation regulating the gas rate in accordanee with the English sliding scale. The agitation is healthful, in that out of it all some sort of protection for capital invested in gas undertakings in New York may be finally evolved.

The situation in Brooklyn remains unchanged, but in the language of the old time almanac compilers, it looks to be safe to exclaim, about mid-March "look out for squalls." Bay State gas, of Boston, Mass., is very uneven just now, and Chicago gas is also dull and drooping. From the way the stock acts, it looks that some one is unloading whenever the price gets above a certain mark in the 90's. The opening to day was made at 89⅛ to 89¼. Baltimore Consolidated is firm at 62½ to 63. Laclede holds its own at 23½ for the common and 73½ for the preferred.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks,
16 WALL ST., NEW YORK CITY.

FEBRUARY 20.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	133	134
Central	500,000	50	90	95
" Scrip	220,000	—	—	100
Equitable	4,000,000	100	198	200
" Bonds	1,000,000	—	106	108
Harlem, Bonds	170,000	—	—	—
Metropolitan, Bonds	658,000	—	110	115
Mutual	3,500,000	100	142	—
" Bonds	1,500,000	—	100	102
Municipal, Bonds	750,000		—	—
Northern		50	—	—
" Bonds	150,000	—	—	100
Richmond Co., S. I.	346,000	50	—	—
" Bonds	20,000	—	—	—
Standard Gas Co—				
Common Stock	5,000,000	100	35	40
Preferred	5,000,000	100	88	91x
Yonkers		50	112	—
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	138	140
Citizens	1,200,000	20	108	—
" S. F. Bonds	320,000	1000	—	103
Equity Gas Light Co	2,000,000	100	45	—
Bonds	1,000,000	—	75	80
Fulton Municipal	3,000,000	100	152	155
" Bonds	300,000		102	—
Peoples	1,000,000	10	114	117
" Bonds (7's)	368,000	—	100	—
" " (6's)	94,000	—	100	—
Metropolitan	870,000	100	150	—
" Bonds (5's)	70,000	—	100	—
Nassau	1,000,000	25	170	—
" Ctfs	700,000	1000	99	100
Williamsburgh	1,000,000	50	155	—
" Bonds	1,000,000	—	107	110
Out of Town Gas Companies.				
Boston United Gas Co.—				
1s Series S.F. Trust	7,000,000	1000	85	—
2d " " "	3,000,000	1000	72½	74
Bay State Gas Co.—				
Stock	5,000,000	50	48	50
Income Bonds	2,000,000	1000	78	80
Buffalo Mutual, N. Y.	750,000	100	110	—
" Bonds	200,000	1000	95	100
Citizens, Newark	1,000,000	50	155	160
Chicago Gas Company.	25,000,000	100	89⅛	89¾
Chicago Gas Light. & Coke Co.—				
G't'd Gold Bonds	7,650,000	1000	85	90½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1000	—	101
People's Gas and Coke Co., Chicago—				
1st Mortgage	2,100,000	1000	—	108
2d "	2,500,000	1000	104	105
Consumers Gas Light Co., Jersey City	2,000,000	100	25	—
Bonds	600,000	1000	85	90
Cincinnati G. & C. Co.	7,000,000	100	192	—
Consumers Toronto	1,600,000	50	190	191
Central, S. F., Cal			90	—
Capital, Sacramento, Cal			55	—
Consolidated, Balt	11,000,000	100	62½	63
" Bonds	6,400,000		107	107½
Citizens Gas Lt. Co., Rochester, N. Y.	500,000	—	85	101
Bonds	250,000		—	—
East River Gas Co., Long Island City	1,000,000	100	100	105
Bonds	500,000	100	100	102
Hartford, Conn	750,000	25	120	128
Jersey City	750,000	20	180	200
Laclede Gas Light Co., St. Louis, Mo.—				
Common Stock	7,500,000	100	23	24
Preferred "	2,500,000	100	73	74
Bonds	9,034,400	1000	85½	86
Louisville, Ky	2,570,000	50	125	130
Little Falls, N. Y.	50,000	100	—	100
" Bonds	25,000	—	100	103
Montreal, Canada	2,000,000	100	200	208
Memphis (Tenn.) Gas	750,000	100	40	—
" Bonds	240,000	100	103	—
New Haven, Conn		25	200	—
Oakland, Cal			40	45
Peoples, Jersey City		—	115	125
" " Bonds			—	—
Paterson, N. J		25	99	102
Rochester, N. Y		50	99	100
Syracuse, N. Y	500,000	25	—	—
San Francisco Gas Co. San Francisco, Cal	10,000,000	100	72¾	73
Washington, D. C	2,000,000	20	240	245
Wilmington, Del.		50	88	90

For Sale.

All the Stock ($50,000), free from Debt, of a Small Gas Plant in a Good Ohio Town.

Address "OPPORTUNITY,"
924-3 Care this Office.

FOR SALE,

Two Westinghouse Engines, of 12 H.P. each.
Ten 12-inch Chapman Valves.

All in good order. Address NEW HAVEN GAS LT. CO.,
922-tf New Haven, Conn.

FOR SALE,

One-fourth Interest and $25,000 Six per Cent. Second Mortgage Bonds

in a Coal Gas Works, located in a prosperous Western town with 15,000 population. Output, 12 million feet; gas, $1.35 per 1,000 feet; Coal, $1.15 per ton; Coke, 8 cents per bush.; Tar, $3 per bbl. in the well. Address "CENTRAL WESTERN,"
920-tf care this Journal.

Position Wanted

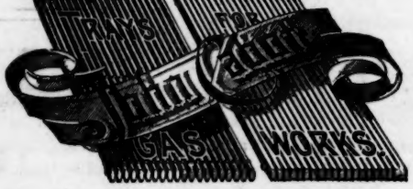
As Manager or Superintendent of Gas Works,

By a practical man of 15 years' experience in all branches of the business. Now 35 years old, and a pusher. Good references given. Address
910-tf "D.," care this Journal.

Special Trays for Iron Sponge or Oxide of Iron.

CHURCH'S TRAYS a Specialty.

Reversible, Strongest, Most Durable, Most Easily Repaired.



306-310 Eleventh Avenue, New York.

We also make the Cheapest and Strongest
REVERSIBLE BOLTED TRAYS IN THE MARKET.
Send for Circulars.

THE GAS WORKS CONSTRUCTION CO.

ENGINEERS AND CONTRACTORS
FOR THE
Erection of New or the Rebuilding of Old Works.

LAYING of CAST or WROUGHT IRON STREET MAINS.

Special Attention Paid to the Building of Holder Tanks.

Plans, Specifications and Estimates Furnished on Application

2 4 & 6 College Place Room 7, N. Y.